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ON THE

ANATOMY AND DISEASES

OF THE

NECK OF THE BLADDER

AND OF

THE URETHRA:

BEING

THE SUBSTANCE OF THE LECTURES DELIVERED IN THE

Theatre of the Royal College of Surgeons

IN THE YEAR 1830;

AND

IN THE WESTMINSTER HOSPITAL IN 1833 & 1834.

BY

G. J. GUTHRIE, F.R.S.

Surgeon to the Westminster Hospital, and to the Royal Westminster Ophthalmic Hospital,
&c. &c. &c.

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Many years have elapsed since a Deputation from the Medical Officers of the Army requested I would publish the Lectures I had delivered to them on the Diseases of the Urinary and Sexual Organs. It is only now, after much deeper consideration, and after a very long-continued observation and experience in their treatment, that I venture to offer this, the First Part of the Work, in grateful acknowledgment of the unlimited and innumerable kindnesses I have received from them.

2, Berkeley Street,
Berkeley Square.

ON

THE ANATOMY AND DISEASES

OF THE

BLADDER AND URETHRA.

LECTURE I.

THE structure and functions of the bladder and urethra in the male, and of the parts connected with them, are of a very complicated nature, and notwithstanding the attention which has been bestowed upon them by many of the ablest anatomists of this and of other countries, there yet remain many points not thoroughly understood, and which are open for investigation. There are, indeed, few parts of the body which do not deserve a renewed and attentive examination, and whenever that has been given, I do not believe there has been an instance in which the labour of the inquirer has not been duly rewarded.

The continual calls on the bladder, from the commencement to the termination of life, under circumstances which are frequently foreign to the natural state of man; and the double function which the urethra has to perform, during a long period of what is often an artificial mode of living, tend constantly to their derangement; and whilst, like every other part of the body, they contain within them the seeds of their dissolution, which would sooner or later develop themselves in the ordinary course of nature, they are often caused to germinate at a much earlier period, by the irregularities and vicious propensities of man himself.

The diseases to which these parts are liable would be few until the middle period of life was passed, if it were not for the indulgences and irregularities, which usually prevail in a highly civilized community, and more commonly give rise to them. They are not, however, the less sensibly felt, because they are sometimes merited; they are always, when severe, the source of great anxiety of mind and distress of body, leading gradually to premature decay, and terminating not unfrequently in a protracted and painful dissolution, for which the powers of science or of art avail but little. At an earlier period, surgery can often afford great and important relief; it can as often prevent further mischief as it can cure that which exists, and is a source of no less satisfaction to the surgeon than it is of delight and of happiness to the patient. I know of no diseases for the cure of which the gratitude of one man to another is more often and more cordially expressed.

The views I have taken of the anatomy and relative situation of some of the parts concerned in these complaints, differ occasionally from those which are generally entertained, and lead sometimes to different conclusions, both as to the seat and nature of the disease which affects them, and the proceedings to be adopted for their relief. I shall, therefore, as we proceed, demonstrate these points, both from preparations and the recent state, so as to bring each part in immediate connection with the subject it is intended to illustrate.

The shape of the bladder has been differently described by authors, according as it has appeared to them, under various circumstances, of age, sex, and of disease; whether it be oval, rounded, flattened, or acuminated, it matters not: there are however in all certain points of resemblance and of importance, which require attention. In the healthy state, the bladder is capable of great extension and of a corresponding contraction; it has therefore at first sight, a structure apparently membranous, but, on more minute investigation, this is easily divided into several layers, connected by cellular tissue. The external or partial covering of the bladder is derived from the peritoneum; if this be removed the external muscular coat is exposed, the fibres of which run in a longitudinal direction, admitting readily of separation one from the other, as the bladder is dilated laterally; and from the internal muscular layer beneath it, from which it may be easily reflected in many places. The fibres of the internal muscular layer run more in a spiral, oval, and transverse direction; they are best seen from the inside of the bladder, and when it happens to be thickened they project into the cavity, forming, as in the preparation before you, strong bands or cords covered by the mucous membrane or lining of the bladder, which is of a pale straw colour, and offering nothing remarkable in its appearance. When the bladder is moderately distended in situ, the part which rises up into the abdomen, and which is sometimes of a pyramidal shape, is called its summit, the anterior and posterior parts are more or less flat, the sides or edges are rounded, whilst the lowest part, which is deeper, rounder, and broader than any other, is called its base, the *bas fond* of the French anatomists. The opening or meatus through which the urine passes, is the commencement of the neck of the bladder; it is situated at the lower portion of the anterior part, and opens internally almost abruptly, or with a very little depression, but in no way resembling the funnel-like process to be observed in animals. If the bladder be now opened, or cut across transversely, this part will be seen sometimes resembling a perpendicular slit, at others being more rounded. Below and behind this opening, there is a space of a triangular form, evidently whiter and of a more condensed and elastic structure than any other part; the apex of this triangular spot, *trigone* of the French, is formed by a slight projection at the very opening of the bladder, called its uvula, or *luette,* whilst the base of the triangle is marked by a strong whitish-coloured band, which passes transversely across from side to side. The ureters open within the two extremities of this band, and from these two another more prominent line or band descends, inclining inwards, so as to meet like the letter Y, the point being inserted into and behind the uvula. The width of the base is about an inch and a quarter from the opening of one ureter to that of the other; and there is about the same distance from the apex of the triangle to the base. The ureters descending from the kidneys enter the back part of the bladder obliquely, first passing between the longitudinal layer of fibres and the spiral ones, and then obliquely through them also, to open near the extremities of the base of the triangle above described. The orifices of the ureters are surrounded by the peculiar condensed and elastic substance which lies beneath the mucous lining of the bladder, and between it and the muscular coats. This superadded structure begins then at the base of the triangle, inclines inwards as it advances towards the neck of the bladder, forms in a great measure the orifice, appears to be continuous in the passage inwards, and to constitute the elastic membrane of the urethra. This triangular space of the bladder being elastic, yields to a certain extent to any reasonable extending force, from which point it returns to its original situation, on the removal of the extending power. The orifice of the ureter is small, and is only enlarged with great difficulty and after much suffering during life, on account of the comparatively unyielding nature of the substance in which it is situated. If the ureter itself be much enlarged by long continued pressure and retention of urine in it, the orifice still remains of its usual size. This is shown in the preparation I place before you, in which one of the ureters is much dilated: but if a stone descends from the kidney, the greater solidity of it when impelled from behind by the urine, enables it to pass through by dilating the orifice of the ureter for the time, but then only with much suffering. If the stone is large it sometimes sticks in the orifice and cannot pass through, giving rise to continued inconvenience, and to the symptoms of stone in the bladder from sympathy. This is exemplified by a preparation in the museum of the Royal College of Surgeons. The patient, a gentleman, consulted several surgeons of eminence, was sounded, the stone was detected, the operation was declared to be necessary, but was deferred for two or three weeks, until he should improve a little in health. This however he did not do, but on the contrary gradually got worse and died. On examination the stone was found sticking in the orifice of the left ureter, as I have described it. If an operation had been done, the stone would probably not have been extracted, its situation might not even have been detected; and it shows the propriety and necessity of not only being able to feel a stone *distinctly*, but also to be able to move it *distinctly* with the sound before an operation is resorted to.

The linear bands, descending from the ureter on each side, are composed of a substance partly muscular, partly elastic. They have been called the muscles of the ureters, and are described as inserted, fleshy and tendinous, into the prostate gland. They appear to me to be inserted fibrous into and behind the uvula, but the fibres of the bladder generally vary much with regard to the manner in which they pass over or are inserted into the prostate: and I have no doubt that some fibres may be found passing into the posterior edge of the gland, as has been stated by Sir C. Bell. It is presumed that the ureters have no valves at their orifices to prevent the reflux of urine into them after it has passed into the bladder, that they enter obliquely to answer this purpose, and that the coats of the distended bladder, pressing on them in their oblique passage, prevents this reflux from taking place. It appears to me that this mechanism is for the very reverse object; and that the ureter opens on the peculiar condensed structure, in order that the orifice may be constantly patulous; and the obliquity of the passage through the coats is for the purpose of giving facility to its being pressed upon by the muscular coats of the bladder, when the viscus is in a distended state, and in order to delay if not to prevent the further flow of urine into it. When the bladder is contracted and empty, the urine passes readily into and gradually dilates it, until the desire for expulsion comes on and leads to its evacuation; but a little more or a little less seems to have no influence in preventing the urine from finding its way in, the weight of urine descending from the kidney readily overbalancing to a certain point the resisting power of the coats of the bladder. When the bladder is however distended, its coats no longer yield easily, the ureter is pressed upon by the muscular wall in its passage through it, and the further entrance of urine is in a great measure prevented. If this process be long continued, the ureter above this part dilates from the size of a crow's quill to that of a man's thumb, and even larger; the pelvis of the kidney also dilates, a low or chronic inflammation is induced, the secretory organs are pressed upon and partially removed, so that the kidney may become almost an empty bag separated by partitions, indicating only the former existence of its lobes. A total suppression of the secretion may under these circumstances take place at any time. The most remarkable example of the kind which has come under my observation occurred in the case of a lady, who suffered from a cancer of the uterus; the disease after a time extended towards the ureters, which at last were embraced and pressed upon by it as they entered the bladder. The lady, as this took place, began to suffer more than commonly from derangement in her urinary apparatus; the bladder was found ultimately, on passing the catheter, to contain little or no water; she fell into a state of low fever, became paralytic, afterwards comatose, and died. On examination, the ureters were found impervious at the part where they were grasped by the diseased structure; above this they were greatly enlarged, the kidneys were also dilated, and she had died paralytic and apoplectic, as all persons do in whom the suppression of the secretion is complete. The same changes take place, as I shall hereafter show, in most cases of chronic disease of the bladder; and it is a provision of nature for which this mechanism is intended, to prevent the too rapid flow of urine into the bladder, rather than to prevent a distension of the ureters, which could not, I believe, occur in this way, for some part of the bladder or urethra would yield by rupture or ulceration before the pressure on the secreting vessels of the kidney would be so great as to put a stop to their office, or to dilate the ureters. Nature can accommodate herself for several days, and in some instances for weeks, to a complete suppression of the secretion of urine; and for a very long time to a partial secretion of it. If the natural quantity usually secreted varies from two to two pints and a half in the twenty-four hours, and an obstruction takes place preventing its evacuation, the bladder will be considerably distended; but the same quantity will not be secreted during the second twenty-four hours, and still less during the third; when relief must be obtained by surgical means, if it does not occur otherwise, or great mischief will ensue. The provision of nature is therefore, as far as possible, to protect the bladder and urethra, rather than the constitution of the patient, the bladder and urethra being more susceptible of mischief than the system at large. I am more disposed to believe that the two bands on the triangular space, called the muscles of the ureters, are better fitted for keeping the part fixed, and for strengthening and raising it up when necessary, than for keeping open, and in a straight line, the channel of the ureters, which hardly stand in need of such particular apparatus to effect this object. In several of these preparations now before you of diseased bladders, these bands are large and well marked, but not out of proportion.

The triangular space is very vascular compared with other parts of the bladder; it is highly sensible, the nerves being directed to, and communicating more particularly on it as they descend on each side from the inferior mesenteric and the hypogastric plexus, and arise from the third and fourth sacral nerves. It is therefore very excitable, and when irritated, gives rise to the desire to evacuate the bladder, as well as sometimes to very great pain, as all have experienced who have suffered from stone in this viscus. The idea entertained by some, that a bougie touches this part on entering the bladder, and in this manner gives rise to the desire which is usually experienced to pass the urine, is certainly erroneous; for when a healthy bladder contains a moderate quantity of fluid, a bougie will only touch the very apex of this space on its entrance into the bladder; and observation has led me to believe, that this desire takes place when the instrument has entered that part of the urethra which is surrounded by the prostate, and previously, therefore, to its entrance into the bladder, the same nerves supplying both parts. In the healthy state of the bladder, the viscus, when moderately distended, enlarges considerably downwards towards the rectum, and the triangular space descends, rendering it impossible for a bougie to touch more than the apex of the triangle, unless it be curved at the extremity. This descent of the triangular space can scarcely, however, take place, except when the bladder is in a healthy state; for when it becomes much thickened it loses its capability for dilatation, and it contains too small a quantity of water to render this a descending or protruding part. This triangular space rests on the rectum, and the bladder is punctured through it when that operation is done; but which I do not recommend to your attention, believing that it ought to be superseded in almost every case by another, which I shall in due time bring before you. The operation of puncturing the bladder through the rectum was founded on the supposed anatomical fact, that the triangular space rested on, and closely adhered to the rectum, so that the urine would flow direct from one into the other, without escaping into the neighbouring structures; but it has been shown, that the peritoneum instead of passing down behind the bladder, and between it and the rectum to the base of the triangular space, and there terminating in a cul de sac, does sometimes pass on further, between the triangular space and the rectum, and even occasionally up to the prostate gland; so that by puncturing through the rectum the genera cavity of the peritoneum is opened before the bladder is penetrated, and the patient in such case must be lost, from the urine finding its way into the peritoneal cavity, and giving rise to an inflammation which has always been destructive whenever this kind of effusion has taken place, and from whatever cause. I am not aware of there being any signs by which this conformation can or cannot be distinguished, and consequently, if that opinion be correct, the safety of the patient depends not on the knowledge and ability of the surgeon, but on an accidental although the more usual formation of the part on which the operation is performed. The corresponding portion of the bladder, on its anterior part, is in a similar manner devoid of peritoneum, and has been made the subject of puncture above the pubes. This operation I also object to in almost every case, as being either unnecessary in most instances in which it is done, or as not being to be preferred when an operation is absolutely required to give the necessary relief. Both these points we shall discuss in their proper places, and I shall then bring before you in a more particular manner, the relative anatomy of the parts more especially concerned; for although a teacher of anatomy ought to go through his subject connectedly, it is my belief, that a teacher of surgery should always demonstrate the anatomy of that part only, and as it were renew your acquantance with it, about which he is endeavouring to impress on you the proper principles under which you should act in disease.

Behind the base of the triangular space the coats of the bladder are usually thin, although the transverse bands of muscular fibres are more strongly marked, passing across like strong distinct cords, and sometimes running in an oval direction. This greater thinness of the coats at this part, and the direction of the fibres, often admit of a hollow being formed, in which a stone often lies, and may remain sometimes undiscovered. In the bladder I now show you, and in which this hollow is well marked, fifty small stones were found after death. This hollow is part, however, of the general cavity of the bladder, and is a very distinct thing from certain pouches which are occasionally formed in it; these are sometimes very large: the bladder I now show you has five pouches in it of different dimensions, all communicating with the common cavity by small openings, although they afterwards enlarge to a considerable size. These pouches occur much more frequently than is commonly supposed, and cause great inconvenience. In the museum of the Royal College of Surgeons, there are several very fine preparations, in which they are remarkably large, equalling the size of the bladder itself.

The formation of these pouches depends upon the peculiar structure of the bladder, and on the obstruction it meets with in the due exercise of its function, in the manner I shall endeavour to explain. There are certain points, you have already heard, in which I differ from some anatomists, and this is one; and there are others which I shall state from time to time, merely premising, that in matter of opinion I am very willing to yield and to consider myself in error, but in matters of fact, none of us ought to concede except on demonstration, and I hope all of us will submit to proof. The longitudinal muscular coat of the bladder is composed of a layer of fibres, which have in some parts little lateral connection with each other, and are consequently capable of easy separation. The manner in which they are disposed you can see in the fresh bladder before you, as well as the points of communication between their respective fibres. If this coat be dissected off, by making an incision extending from the centre of the fore part of the prostate to the summit of the bladder, and if it be then turned outwards to the right and left, it will be seen that it passes over the prostate, and is not confined to the bladder alone. As the fibres descend from the top and sides of the summit, they sweep by the ureters, becoming more compact and firm, and in many cases some are reflected back upon the ureters, fixing and steadying them in their places. They then lie upon the sides of the prostate, being partly inserted into it and into a tendon, which they form on the fore part of the prostate, and which is usually double, one proceeding from each side. These tendons are in connection on their upper part with the pelvic fascia, and are commonly termed the *inferior ligaments of the bladder,* and by the French, the *pubio prostatic ligaments.* In the preparation I now show you there was but one tendon in the centre, and the fibres from each side converged, and were inserted into it. My old master and friend, the late Mr. Wilson, who was perhaps the best, as he was certainly the most laborious anatomist of his early days in London, used to say that the number of those tendons was uncertain, that he had often found three and even more; be they however more or less in number, they run on to be inserted into the pubes near its symphisis. If the attachment which the pelvic fascia, descending from the pubes, has with them be dissected off, some fibres will often be seen arising from them a little anterior to the prostate, and running backwards and downwards in a radiated form, as you see in this preparation, to the fore part and sides of the prostate gland. These are the fibres which modern French anatomists depict in this situation, particularly Blandin; and they are, I presume, the anterior compressors of the prostate of Winslow, mentioned also by British anatomists, but not shown in their engravings of these parts, any more than those which I have been describing as belonging to the bladder, and compressing the prostate in a more marked manner. The longitudinal fibres of the bladder cannot embrace the back part of the prostate on account of the vesiculæ seminales, which would interfere with their continuance in this direction; they are, therefore, inserted into a sort of tendinous line, short of, but attached to the posterior part of the prostate. In these preparations, and in others on the table, you will see this apparent termination which is underneath the uvula of the neck of the bladder. They do not, however, always terminate at this part; for in one preparation a strong band of muscular fibres is seen going into the prostate; and Mr. Hancock who dissected it was obliged to divide a portion of the gland, to show them terminating and apparently inserted into the verumontanum with the ejaculatory ducts, which they appeared to surround. You are aware that my various avocations will not admit of my making these dissections myself; I can only direct and superintend, and when any thing appears doubtful, examine, and re-examine, until it seems to be clear and demonstrable. You are therefore indebted to Messrs. Taylor, Bedford, and Hancock, who have been particularly diligent students, and therefore attached to me at the ophthalmic hospital, for the various preparations I shall show you. The strong transverse and spiral cords, observable in the inner layer of the muscular coat of the bladder, you can see from the inside without any preparation, except at the neck of the bladder, where they are rarely or scarcely perceptible. These gentlemen and I have made many attempts to discover circular fibres around the neck of the bladder, but we have not succeeded satisfactorily, so as to show any of importance. In this preparation there are some transverse fibres, crossing directly over the opening from the bladder into the urethra, and they are the most marked I have seen or could discover although the mucous membrane has been carefully dissected off in several of the preparations before you, both in the recent state and after lying some days in spirits. I am of opinion then, that the portion of the bladder surrounding the opening into the urethra possesses but little muscular contractility, whilst it is endowed with a considerable degree of elasticity, which any one may ascertain by stretching the part. When the two muscular layers of the bladder contract, its tendons inserted into the pubes, become with the prostate generally the fixed points, the urine is forced against the orifice of the urethra, which yields by its elasticity, and returns to its former state when the pressure is removed. I am aware that in certain paralytic states of the bladder, the urine may be made to flow by pressing on the abdomen immediately over it, which cannot be done in a healthy person, and this would seem to imply, that a muscular power was the cause of the urine being retained; although, on the other hand, the urine is retained and collected in considerable quantity in some paralytic cases without making its escape when assisted by the erect position, implying that there is also an elastic power acting at the neck of the bladder. That fibres have been described surrounding this part is undoubted, but no anatomist has dissected them in such manner as to admit of their being truly called a sphincter muscle, although that is the name given to them. It is possible that this part may be both muscular and elastic, and I am willing to take that view of it, but it is right I should tell you it has been supposed by the older anatomists, that the muscular power which prevented the flow of urine resided in those muscles which surround the membranous part of the urethra; and I have it in my power, indeed the preparations are on the table, to show, and therefrom to describe to you, muscles of that part unknown to modern anatomy, which will in future attract considerable attention.

It is a matter of very little consequence, whether it be decided that the part surrounding the orifice of the bladder be acted upon by a structure entirely muscular, or entirely elastic, or partly both; but the fact of there being an elastic structure at the part is of great importance, because it enables us to account for the occurrence of certain diseases, in a more satisfactory manner than formerly. It enables us to take new views even of these diseases, and I hope to adopt new modes of practice, which will be found more beneficial in aid of our suffering fellow-creatures than those which are commonly resorted to.

The term, neck of the bladder, is one which has several meanings; some anatomists confining it to one part, some to another, and even including the whole of that portion of the urethra which passes through the prostate gland. I always however understand, and shall speak of the neck of the bladder, as of the small part surrounding the very opening itself into the urethra, and which therefore is a ring, a little broader or thicker than the bladder itself. It is that portion on which the uvula is situated, the urethra being before, the bladder behind it; and the abruptness with which the opening commences, when viewed from within, appears to me to warrant the acceptation of the term, whilst the diseases which affect this part render it worthy of an accurate definition. When it loses the natural elasticity with which it is endowed, and which it does from internal changes the consequence of disease, it becomes firm and contracted, constituting a structure resembling in many respects those which take place in any part of the urethra. In common language among unprofessional persons, a stricture at the neck of the bladder is often said to exist; but gentlemen know nothing of the exact situation of internal parts, and suppose that an obstacle at six or seven inches distance from the orifice of the urethra must be at the neck of the bladder. It is not however within two inches of it generally speaking; and if you refer to the latest surgical authorities on this subject, you will find it I believe invariably stated, that stricture does not take place beyond seven inches, or the commencement of the membranous portion of the urethra; and all the derangements which occur beyond that part, are attributed to disease of the prostate. This is however a very great mistake; this gland is by no means so often in fault as it has been presumed; and no greater error has been committed in surgery, than that which supposes the third lobe as it is called of the prostate, to be the common cause of those difficulties in making water which occur so frequently in elderly people, and sometimes in young ones. I do not deny that a portion of the prostate does enlarge and project into the bladder, preventing the flow of urine from it; but I mean to affirm that this evil takes place more frequently, and is more effectually caused by disease of the neck of the bladder, totally unconnected with the prostate than by disease of that part; a fact I consider exceedingly important, because it leads to improvement in this branch of surgery, and to the introduction of more effective means of cure. A knowledge of this fact enables us also to understand how other diseases of the bladder take place, and how other symptoms not hitherto explained have arisen; but this subject is so important, that I shall defer it until the next Lecture.

LECTURE II.

The prostate gland is a substance of a tolerably firm consistence, and of a whitish grey colour, placed in immediate connection with the orifice of the bladder, and nearly surrounding the first portion of the urethra. It is in the healthy state about fifteen lines in length; and has been compared in shape to the ace of hearts, or to a flattened chestnut, the base being turned towards the bladder, the apex forwards towards the urethra. When it is divided longitudinally, that is by an incision made through the bladder and urethra, the greatest portion will be perceived to be below the urethra, although there is a great difference in this respect in the various preparations before you. When the smaller or upper portion only is divided, and there is sometimes but little or even none above the urethra at this part, and the neck of the bladder is laid open, a strong raised white line is seen running from the uvula vesicæ, in the centre of the under part of the canal, having from its being elevated a slight hollow on each side of it; and which line as it proceeds, assists in forming an oblong body nearer to the apex of the prostate than to the bladder, called verumontanum, and from its resemblance to a cock's comb the caput gallinaginis. From the base of this elevation the white line runs again forwards, and becomes indistinct in the bulbous portion of the urethra. It appears to strengthen these parts, and connect them more intimately with each other.

The ejaculatory ducts open on the sides of this little elevation, which is composed principally of the mucous lining of the urethra; and on its upper part there is a lacuna or hollow called the sinus pocularis, which is sometimes so large as to admit the end of a small bougie to enter, but over which a rounder and larger pointed instrument passes readily, demonstrating to the surgeon the nature of the obstruction, and preventing a repetition of the accident; this circumstance is however of rare occurrence, the smallest bougie generally passing over, or rather by the side of the sinus pocularis, without being entangled in it; and it is probable that the white line I have alluded to, by making a slight elevation in the middle, directs the small bougie into one of the hollows on either side of it. On the floor of the urethra, by the side of the verumontanum, you see the ducts of the prostate opening, generally about eight in number on each side, and arranged in the form of a crescent; they are sometimes more numerous, communicate with each other before they open into the urethra, and have been enumerated as high as from thirty to forty. They are ducts leading from follicular glands, situated in the substance of the prostate, and are best shown by squeezing the recent part, when the secretion flows through them. The widest part of the gland is from side to side, there being nine lines from the centre of the urethra to its external surface in a well-formed prostate; but if the incision be not made transversely, but diagonally outwards and backwards, it may be a little more.

The prostate in the fœtus is composed of two parts, each part consisting of two lobes, on which account perhaps it was, that the older anatomists called them prostates in the plural number. Between the fourth and fifth month before birth the two internal lobes unite, and the gland is then composed of three parts; but these again, between the sixth and the eighth month, lose their separate form and become one substance. The base of the gland, or the part by which it is applied to the bladder, is notched or deficient in the middle, and particularly at the under part, where it is much flattened, and in the median line depressed, which together with the passage of the urethra through it, seems to divide it into two lobes. A little below where the notch terminates, the ejaculatory ducts enter; but they do so by perforating the gland at a part which is a little hollowed out, and not by passing between the lobes to reach the side of the verumontanum. The portion of the gland nearer to the bladder than the ducts, forms a sort of bar or connection between the two lateral portions, and this part sometimes takes on different forms. There is only one preparation out of eighteen on the table in which it is rounded like a little nipple, but it sometimes does assume this form; and Sir E. Home thought it right, from this not usual appearance, to term it a third lobe. It was well known to previous anatomists: Mr. Hunter had not only described it in disease, but had a drawing made of it, which is now No. 123, Fig. 1 and 2, in cube 4, drawer 8, in the museum of the College of Surgeons; and which drawing Sir E. Home had engraved.

It is a curious circumstance that the preparation No. 764, which was engraved by Sir E. Home to show this third lobe in a state of disease, merely shows a small elevation at the termination of the two bands leading from the ureters internally, and that no examination was made to prove whether this was or was not a part of the prostate. I have examined the preparation attentively, but the parts are so hardened by their long immersion in spirits, that the prostate cannot be dissected, so as to show any thing like the entrance of the ejaculatory ducts into the prostate itself. The fact of an enlargement of the third lobe can only now be ascertained by dividing the bladder and urethra in their longitudinal direction: and I shall propose to the board of curators to do so, for it is rather unaccountable that such men as Mr. Hunter and Sir E. Home should have had drawings and engravings made to show disease in a part, which part was not examined in the only way by which the proof could be given that it was actually diseased.

There is another thing no less remarkable, and it is, that it is quite clear from the remains of Mr. Hunter's papers preserved in the college, that he had anticipated Sir E. Home on every point connected with this subject.

The prostate is applied above and to the sides of the neck of the bladder, but is generally wanting at the under part, unless the bar uniting the lateral lobes, or as it is termed the third lobe, is unusually large. The under portion of the neck of the bladder is not then always surrounded by the prostate; and the uvula vesicæ, the crête vesicale of the French, is not necessarily connected with its third lobe, or with any other part of it. On the fore part and sides the outer or longitudinal layer of fibres of the bladder pass over the prostate; on the under part they generally stop short of it, but sometimes perforate its under surface. The middle layer and the elastic or superadded structure appear to be attached to it, whilst the mucous coat, which possesses no peculiar properties, seems only to be connected with it through the medium of the cellular texture uniting it with the subjacent parts.

It appears then that the following facts may be deduced from the preceding statements:—

1. That the elastic structure at the neck of the bladder may be diseased without any necessary connection with the prostate gland.

2. That the prostate may be diseased without any necessary connection with the elastic structure.

The preparation I now place before you is the most valuable one in my possession. It shows the elastic structure at the neck of the bladder diseased, without any affection of the prostate, and particularly of the third lobe. The patient passed his water with great difficulty, in consequence of the barrier formed by this unyielding structure, and died ultimately of the disease after much suffering. This case and dissection establish in the most clear and decided manner the fact I have been endeavouring to impress upon you, *viz.*—of a separate disease of the neck of the bladder, which has been hitherto considered as dependent on an affection of the third lobe of the prostate. To prove this has been the principal object in making all the dissections you have seen.

I am indebted to Mr. Andrews, of the London Hospital, for the diseased parts I now show you. I mentioned to him, at the Court of Examiners of the College of Surgeons, some of my views on these subjects, and he was so good as to promise me any thing that came in his way which might throw light upon them. It will give me pleasure to receive and to acknowledge assistance of a similar kind from others of my professional brethren; and if they have poor persons under their care with these complaints I shall be happy to take them into the hospital, or to do any thing that may be agreeable to them. The French, in accumulating diseases of the same kind under the care of one person, often obtain more satisfactory results than we do, who have not the possibility of making such arrangement. I shall be glad to return the obligation with respect to other diseases in which I may not take the same interest, and with respect to which other surgeons may have some peculiar ideas, or modes of treatment.

In this preparation of Mr. Andrews' the right lobe of the prostate is seen of more than twice its natural size; the left is a little larger than usual. When the bladder was opened, the orifice into the urethra was found dilated to the size of the end of the little finger, and perfectly round at its upper half, but this opening was nearly closed by the enlarged right lobe of the prostate which lay in front of it, and pushed the urethra to the left, whilst it had drawn up the mucous membrane of the bladder so as to form a bar across its under part. This bar is quite membranous, and does not include the elastic structure which is not diseased, neither is that part called the third lobe, nor is there any projection into the bladder, save the bar or valve formed by its mucous membrane at the very meatus. This patient was eighty years of age, had passed his urine with much straining long previously to the last attack, which came on a few days before he died. The catheter was passed with considerable difficulty, and he sunk at his time of life, under the irritation induced constitutionally. The bladder was very large and but little thickened, the transverse bands on the back part are particularly isolated and strong. In the oval hollow behind the triangular space there were fifty small stones.

In this case the disease was exactly the reverse of the other, the prostate was alone affected, and the bar formed at the neck of the bladder consisted of its mucous membrane, elevated and drawn tight across the under part of the opening, in consequence of its connection with the prostate through the subjacent parts. If the prostate could have been removed, the mucous membrane forming the bar would have fallen back into its proper place. If this bar could have been divided, a great obstruction to the flow of urine would have been removed, and a proportionate relief obtained. When there is a third lobe of the prostate, and it is diseased and projects into the bladder, the elastic structure of this part usually partakes of the evil, forms a hard firm bank in addition to the nipple-like valve, and between them the retention of urine may become complete. This disease with its complication is much less curable than the disease of the neck of the bladder alone, and the necessity for a distinction between them is so much the greater, believing as I do, that relief from this latter complaint is always in the hands of the surgeon.

In its simple or first stage, when there is only a defect of elasticity, it gives rise to stricture at the very neck or orifice of the bladder, curable by common means if properly applied. In its second stage, when the bar is formed and becomes more or less rigid, a small bougie rests against it, and if made of soft materials bends, and cannot be made to proceed; if a solid instrument, it passes in one of the hollows on each side of the white central line, which are also deepened by the elevation of the uvula vesicæ, catches on the valve at the entrance, and when the handle of the instrument is depressed, it raises it, bladder, rectum and all upon its point, until the pain or the resistance induces the surgeon to forego the depression, or the valve yields or is torn, when it finds its way into the bladder; or perhaps the surgeon not possessing much experience, is satisfied with the distance the instrument has gone in, and supposes he has passed it into the bladder. This is one of the evils which arises from the attention which has been paid to the length of the urethra with regard to inches only; for when a man is told that the urethra is often only eight inches long, and finds his instrument has passed perhaps more than nine, he may deceive himself, although his patient is not relieved. I had a gentleman from America under my care lately under these circumstances. He had never passed his bougie beyond the neck of the bladder, although he and his surgeon supposed they had done so. When I succeeded in doing it, he became sensible of the difference; and I desired him, on his taking leave, always to use in future a No. 12 catheter, with a very round point, that the passage of urine through it might convince him of the fact.

When the disease reaches its third stage, or that which gives rise to considerable difficulty and straining to pass water, and which cannot always be effected, many serious symptoms arise. These will be noticed in their proper places, but there are two I cannot refrain from mentioning, because they have not, I believe, received all the attention they merit, if indeed the symptoms have not been in some degree disregarded, or even overlooked.

When demonstrating the structure of the bladder, I drew your attention in one particular instance to the distinct manner in which the longitudinal and transverse fibres passed across each other at right angles, leaving small intervening spaces, filled up only by the mucous membrane and the cellular tissue by which these parts are united to each other. When the elastic neck does not yield to the natural degree of pressure usually exercised by the coats of the bladder generally in consequence of its being the seat of commencing disease, they are called upon to act with a greater degree of vigour, and in certain cases during this augmented action, the mucous coat becomes distended by the urine, yields and protrudes externally between the muscular fibres; the commencement of an extra vesical pouch is thus formed, which goes on increasing, if the same cause continues which gave rise to it, until it attains considerable magnitude: the opening between the muscular fibres by which it began is usually of a small size, leading to a large cavity into which a stone may pass, and be so shut up as to give rise to no further inconvenience. In other instances, the opening may be large enough and in such a situation as to admit of the stone being struck by the point of the sound, although it will not be as readily extracted after the operation for its removal has been accomplished. In all cases a quantity of urine may and will be retained in these pouches, and sometimes secretions may take place into them of a different nature, depending on the state of the membrane by which they are lined: in one case of this kind, after drawing off the urine by the catheter, and as I supposed emptying it, I found I could still get more by passing it in a certain direction, and in all probability into one of the pouches which are thus formed. This is however an accidental circumstance, which will be rarely met with. If the bladder be emptied by the catheter in the erect position, and the patient be made to change it by lying down, retaining the catheter in its place, an additional quantity may run from the instrument, showing that one or other of these pouches has been emptied. A gentleman consulted me on account of a difficulty he had in passing his water, for which he used an elastic catheter twice a-day and sometimes thrice, with great relief. But the symptom he complained of most, and for which he applied to me, was, that after emptying his bladder in the erect position on going to bed, he soon after felt as much desire as before to make water, and that on straining forcibly he could pass a little. I desired him to use the catheter a second time when he felt this uneasiness, which he did, and obtained about three ounces more water. This led to the belief that he had pouches in his bladder, which were only emptied by change of position. I wished him to ascertain what position emptied them, but he could not do this in a satisfactory manner, for a reason which appeared after death, namely, that there were several pouches, which could not all be emptied by the same position. He obtained considerable relief by first drawing off his water in the erect position, and then by lying down with the catheter in the bladder, and by changing his position from either side to his face (for these pouches rarely form on the fore part) he removed a further quantity, after which he obtained rest, until the pouches and the bladder were refilled, and the desire to discharge his water again became considerable. If this investigation be made in the morning on rising, it does not give so accurate a degree of information, and must not be mistaken for a similar symptom, about which you may be consulted by persons who have no particular disease. It often happens, that at about fifty years of age the urine passes with less force and more slowly than formerly, although there may not be any perceptible or discoverable disease of the neck of the bladder. It has perhaps only lost a slight portion of its elasticity. If the person be very attentive to himself, he finds that he makes his water very well on rising in the morning; and that during the time of dressing, he makes it once or twice in larger quantity. This may happen to any one at any age, and arises from the circumstance of the urine not being secreted usually to any extent during sound sleep, whilst the kidneys become after such state of rest, much more active on the person's moving about. It is not a sign of disease. The urine is also devoid of any offensive smell, which is rarely the case when it has been retained in pouches. In one gentleman, the existence of one or more pouches of this kind became evident on injecting the bladder; twelve ounces of warm water could be thrown into it before much uneasiness was produced; but on drawing it off, ten ounces only could be obtained, and rarely the whole twelve even by any change of position. In the preparation before you there are five pouches of different sizes; and there was one symptom in this case which I had met with in three others, without being able to account for it, and which may have depended on the same cause.

The first instance occurred in the York Hospital, at Chelsea, in the year 1816. The patient, a soldier, had been invalided for some complaint of his urinary organs, of which a stricture formed one. The removal of this did not much alleviate his symptoms, and on examination with the catheter, a smart blow was felt on the instrument with the termination of the flow of urine, giving rise to the idea of a stone. This always took place, and sometimes the stroke seemed to be repeated twice, or even three times, although each time fainter than before. The first blow would sometimes force the catheter from between the finger and thumb when slightly held, and at least two inches out of the urethra. Many able surgeons saw this case, several thought there was a stone in the bladder, and some even advised an operation. It appeared to me and my colleague, the late Mr. Morel, that the blow was deficient in the sound which a solid, hard substance gives, the *tick* as it is often called technically. The substance causing it could never be detected by the most careful examination after the urine had been evacuated, nor while the bladder was full, but only at the moment of its becoming empty; and I was led to the conclusion, that if there was a stone it must be enclosed in a sac, and that it was the soft envelope which rendered the sensation communicated by it so obscure. The man was discharged.

In the second and third cases the sensations were the same, save that the little taps on the catheter resembled more the blows given by the wings of a bird in fluttering, so that I have been in the habit of calling them the *fluttering blows of the bladder* in my Lectures, believing that they depended on some unusual action of the oval cavity of the fundus, or of the base of the triangular space acted upon irregularly by their own fibres, and by those passing perpendicularly and across by the sides of the neck of the bladder, and which have been considered as a sphincter. The last case I met with cleared up the difficulty. The blow was perfect, and resembling that from a stone in every respect save two, namely, the grate which a stone gives or ought to give to either a silver, a steel, or a gum elastic catheter, and the impossibility of finding it except when the last drops of urine were flowing. I examined the bladder several times very carefully, and even did it allowing the urine to flow between the blades of the small calculus forceps, which were kept open to catch any thing which might pass between them. The silver catheter often received so smart a shock, that it was forced out a couple of inches, and from between the fingers when held loosely, so that the patient himself could not help observing it, and asking the cause. I was never satisfied during his life that there was not an encysted stone in the bladder, although I was quite sure there was not a loose one. The examination after death decided the point; there was not a stone of any kind, and nothing peculiar save the five pouches, and the bar at the neck of the bladder formed by its elastic, but now rigid substance, totally unconnected with the third or middle lobe of the prostate; and the peculiar fluttering strokes of the bladder on the catheter, were caused, therefore, I have now no doubt, by the descent of the pouches containing urine, and by their being more or less solid substances, they fell against the instrument, or were brought forcibly against it, by the muscular efforts of the bladder in contracting on the evacuation of the last drops of urine from its cavity.

When symptoms have given rise to the suspicion of the existence of a stone, and the fluttering strokes or blows on the instrument have been felt, I suspect it may have happened that the operation has been performed and no stone has been found. At all events, a surgeon may be forgiven for the mistake more readily in this case than in most others, and I therefore dwell upon it longer than it perhaps requires, in order to prevent such a misfortune from occurring in future. I cannot help thinking it has been the most

Plate

Fig 1

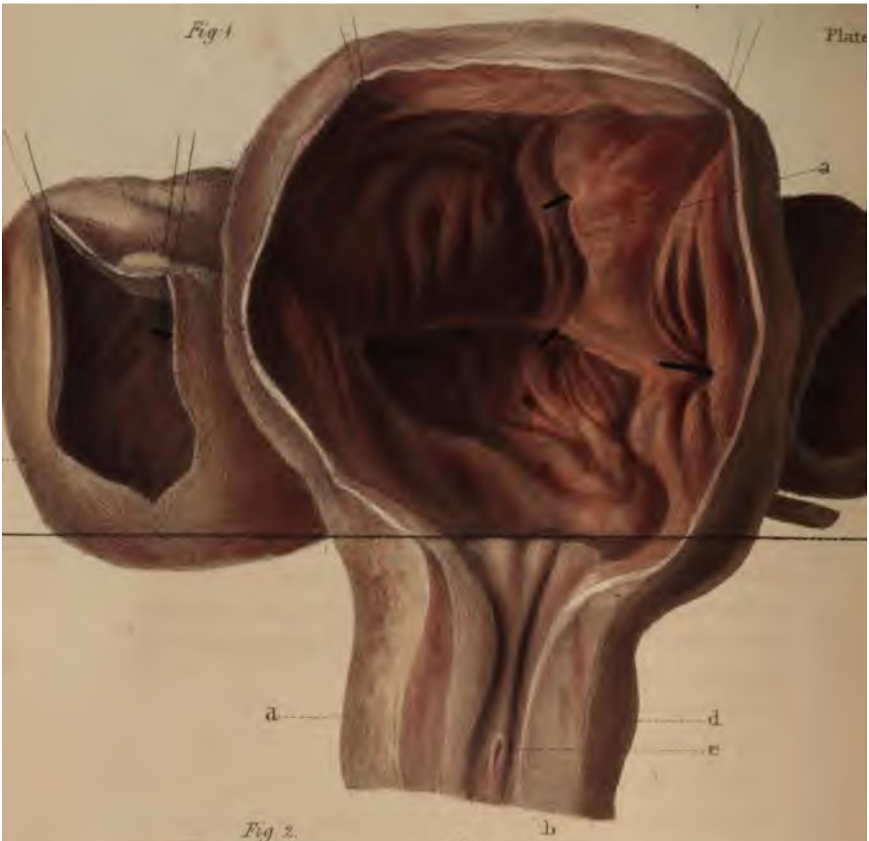
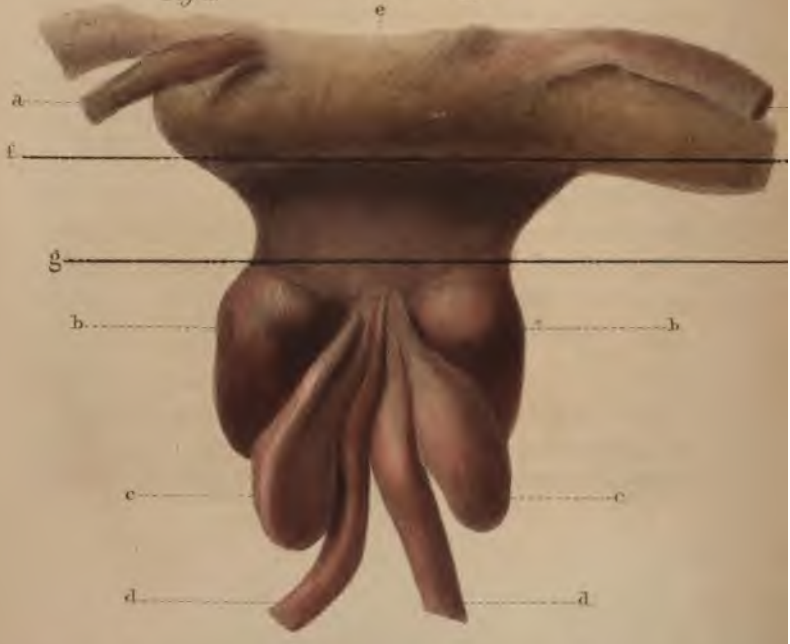


Fig 2.



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common cause of such an accident; and when I hear and have heard, that although no stone was found, the patient, when he survived, was much the better for the operation, I am more satisfied that I am likely to be correct in my supposition. The good done by the operation was caused by the division of the bar at the neck of the bladder, and the consequent removal of the obstruction to the passage of the urine out of it; and I approve of a proper operation being done for this purpose in certain and peculiar cases to be hereafter noticed, but then the patient is not consenting to an operation, supposing it to be for the removal of a stone, and the surgeon is not relieving him by a mistake.

FIG. I.

Anterior view of the bladder, alluded to in the preceding pages.

a. The inside of the bladder in a highly inflamed state, the anterior part having been removed.
b. The urethra slit open.
c. c. Two large pouches cut open, bristles are inserted into their orifices of communication with the bladder, and into those of three others which existed in it.
d. The prostate gland a little enlarged on the right side.
e. The caput gallinaginis or verumontanum.
f. The nipple-like process at the neck of the bladder divided into three small prominences, and forming a bar or dam, preventing the free evacuation of the urine, and ultimately the cause of the death of the individual.

FIG. II.

Posterior view of the lower part of the same bladder.

a. The ureters entering into it.
b. The prostate gland dissected and turned a little downwards, so as to be brought wholly into view at its upper part, the two lateral lobes being distinct.
c. The vesiculæ seminales turned down.
d. The ejaculatory ducts.
e. The situation of a small pouch not seen.
f. This line corresponds with the line *f* in fig. 1, and marks the situation of the bar or dam at the neck of the bladder.
g. A line drawn half an inch below the other, showing the distance between the bar or disease of the neck of the bladder and the upper part of the prostate. This space has been obtained by dissecting and turning down the prostate, so as to show that it was not in any way implicated in the disease. It is formed by the urethra and elastic structure of the bladder passing along with it, and is as thin as a sixpence, except at the part in which the dam or bar is situated.

This preparation proves the nature of the disease alluded to in the most satisfactory manner.

The prostate gland is bounded by some large veins, proceeding originally from the penis, and passing between the tendons of the bladder, which part is also here more particularly fixed by several fasciæ, and especially the inner layer of the deep perineal, and by the pelvic fascia. These and the veins of the bladder have special reference to the operations for the stone, and we shall refer to them in due time with that view. As some of you may not however be here when that time comes, I may say, that my principal observations on these points will be directed to show, that the infiltration of urine, and which I am disposed to say is the principal cause of death, does not prove fatal from its having been caused by a complete division of the prostate, or of a portion of the bladder beyond it, but from its being penned or dammed up, after it has been allowed to escape, by the levator ani muscle, and the deep fasciæ of the perinæum. It is the want of a proper division of these parts that is the real cause of death, and which takes place therefore from a defective manner of performing the operation.

It is usually said, that the female has not a prostate, but merely an erectile tissue surrounding the neck of the bladder, to which I do not assent. If the word prostate be used with reference to its derivation, as standing before the vesiculæ seminales, certainly a woman has not a prostate, because she has no vesiculæ seminales, but if it be used as a substantive word, to express a particular thing, in the same manner as the words arteria innominata are now used as a name for a particular artery, which formerly had no name; then a female has a prostate, for there is a substance of the same shape, form, and nearly of a similar structure surrounding the commencement of her urethra. It is the size of the prostate in a boy before the age of puberty, and resembles very nearly in external appearance the same part in the male. Here are the prostate and bladder of a boy of twelve years of age, and these two other preparations in spirits show the bladder and prostate in the adult female. One bladder is opened from the fore part, the other from the back part, to show how much of this substance lies before and behind the commencement of the urethra. You will observe, in these two recent dissections of the same parts, that the band, on which the ureters are situated, is less marked, as well as those descending from them, than in the male, but the elastic structure is equally evident. The ejaculatory ducts of the male, opening into the urethra, are of course wanting, and there does not appear either to be any ducts of the prostate, so that, perhaps, this substance may be considered in the female to be partly destitute of the follicular or glandular structure, which gives the additional bulk to the male. The fibres of the bladder have the same arrangement in the female as in the male, and I am therefore induced to believe, that the prostate gland in the male has at least three offices, *viz.* 1, to stand before the orifice of the bladder, and give it and the urethra which it surrounds support, and a point more or less fixed, upon which it may act in expelling urine; 2, to secrete a fluid peculiar to itself; and 3, to receive the ducts conveying secretions from other parts; which two latter uses I do not attribute to it in the female, and the want of which may account for the difference of size in this part in the two sexes. At all events, it shall, gentlemen, be our will and pleasure, until further orders from the critics, to give the ladies an organ which they have not of late years been supposed to possess, but whilst we call it the female prostate we will hesitate in adding the word gland. Cowper, who was well acquainted with it, calls it corpus globosum.

De Graaf, in his Work De Mulierum Organis, page 323, has the following passage bearing on this subject. "Sed ulterius, inquiret aliquis, unde illi ductus sive lacunæ humorem illum hauriant? priores, illæ scilicet, quo circa colli orificium et meatus urinarii exitum conspiciuntur, ex *parastatis mulierum* seu potius crasso et membranoso corpore circumcirca meatum urinarium existente humorem suum accipiunt; posteriores verò ex nervoso-membranosâ colli uterini substantiâ liquorem suum colligant."

LECTURE III.

Anterior to the prostate, the urethra is termed membranous for a space something of about or rather less than an inch, being the part between it and the bulb, and is the portion which passes under the pubes. This preparation shows the pubes with its descending rami, the subpubic ligament, and that portion of the deep perineal fascia attached to it which together form the triangular ligament of Camper, as it is termed, and through which the urethra passes, the size of which opening of transmission is distinctly seen. The bulb of the urethra lies in front and in connection with this fascia, the membranous part of the urethra which I am alluding to behind. It is the part I now show, and to which I beg your attention particularly, there being some points connected with it deserving your especial notice, inasmuch as they are new, or have not been hitherto distinctly stated. It was called membranous I presume from the ease with which the canal might be isolated from its surrounding investments, when compared with those portions which pass through the prostate behind and the corpus spongiosum before, as well as from the thinness of its proper coats when thus deprived of its usual coverings. This part, although thin, has always been known to be surrounded by muscular fibres as a probable compensation, and the older anatomists, such as Winslow, Bartholin, Santorini, Gerardi, and others, conjectured that they were capable of acting as a sphincter to the bladder, although situated thus anterior to it. The ideas of these anatomists, both as to the situation, structure, and functions of these muscular fibres, did not receive all the attention they perhaps deserved, and in abandoning the idea of these fibres acting as a sphincter, modern anatomists seem to have attended but little to the subject.

Mr. Wilson, in the first volume of the Transactions of the Medical and Chirurgical Society of London, gave a particular description of two muscles surrounding the membranous portion of the urethra, which attracted the attention of every anatomist in Europe. They have been acknowledged by every one, although none have described them in so precise and apparently accurate a manner as he has done. It is however a very curious circumstance, that Mr. Wilson only described half a muscle, and that the error should not have been detected until the present time.

Mr. Wilson, as I have stated, described his muscles with great apparent accuracy, and declared it was exceedingly easy to find them. To do this he gave directions, pointing out the close connection between them and the levator ani of each side, which induced many anatomists to think they were a part of these muscles, and that distinguishing them separately was after all an act of unnecessary minuteness. I shall content myself with remarking, that this arose from the error Mr. Wilson unaccountably fell into, of examining these parts from a side view only, and made from the left. If he had dissected from behind forwards, I think he must have discovered the whole of the muscle of which he has described only a part. Desirous of having preparations to show at my Lectures, which should enable me to demonstrate all these parts in the clearest manner, I set Mr. Taylor to work last year to prepare them. He could not however succeed to my satisfaction; the muscle was never perfect, according to Mr. Wilson's description of it. On one occasion, dissecting from behind forwards, and not by a side view, he made out an attachment on the left side, formed by some fibres running from the ramus of the ischium to the membranous part of the urethra; this I took to be an accidental occurrence at the time; but keeping it in recollection, on making some more dissections during this winter, and there are twenty before you, I desired that particular attention might be paid to this point; and the results of our labours, that is of Mr. Taylor, Mr. Bedford, and mine, enable me to show you these muscles in a complete state. The two preparations I place before you now are the most perfeet. One shows the membranous part of the urethra surrounded by a well-defined muscle. On the upper part there is a central median line of tendon, which runs backwards to be inserted into the fascia covering the upper surface of the prostate; and again forwards on the urethra through the triangular ligament to be inserted in front of it near the union of the corpora cavernosa. On the under part a similar tendinous line is to be observed, which is attached backwards to the fascia underneath the apex of the prostate, and forwards to the central tendinous point in the perinæum. The muscle on its upper surface is covered by fascia descending from the pubes which adheres to it, and this I take to be what Mr. Wilson described as the tendinous origin of his muscle, and from which he supposed the fibres descended to surround the urethra, which they really do not. From the median tendinous line in the upper part of the urethra the fibres pass outwards on each side, converging towards the centre, where they form a leg, as I term it, of muscular fibres. On the under surface the same thing takes place; and a leg on each side being thus formed from the superior and inferior fibres running from each half of the urethra, they pass outwardly, that is transversely across the perinæum, to be inserted into the ascending ramus of the ischium a little below its junction with the descending ramus of the pubis on each side. These attachments are cut off in this preparation, but when I pull on each of these legs you see that they surround the urethra like a sling.

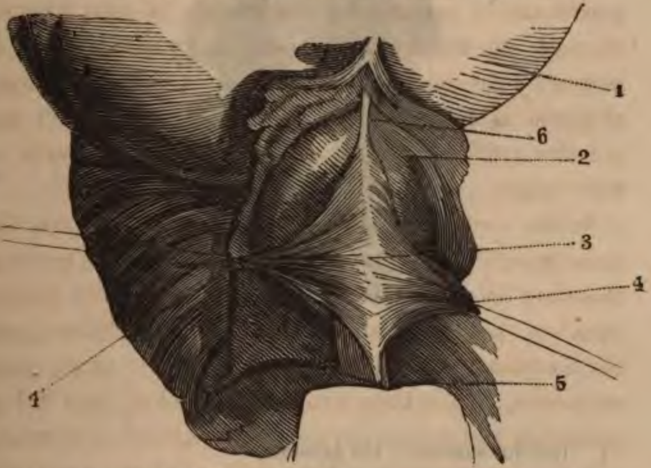
In the preparation I now present to you, nearly all the parts are in situ. You see the muscle or muscles and their origins one on each side, which are very peculiar. They are inclosed between the two layers of fascia forming what is commonly called the deep perinæal fascia. The anterior layer is turned down as well as the triangular ligament from the pubes; and you see the muscle on each side with its origin, and lying between the anterior and posterior layers of the fascia. The pudic artery on the right side runs in front of it, and you see here the division of that vessel into the two arteries of the corpus cavernosum and of the dorsum of the penis. Cowper's gland on each side lies under or posterior to the muscle, and seems to be enveloped by it. The inner layer of fascia passing on the inside of the muscle reaches the inner edge of the levator ani, round which it turns to invest the urethra and prostate; so that this fascia separates these two muscles, the fibres of which also run in different directions. This is distinctly shown, and it is manifest that the muscle I have described is inclosed between the layers of fascia, which is I presume the reason why it has escaped the observation of the very many minute anatomists who have investigated these parts.

The preparation I now show you is an internal view of the pubes, with its descending rami and the ascending rami of the ischium. The deep fascia of the perinæum is preserved: the urethra is seen passing through the triangular ligament, surrounded before it passes by the muscles in question; the internal layer of fascia is turned down, and the two legs of the muscles are seen passing outwardly or transversely to their origin.

In the two recent dissections I now show you, the same muscle or muscles are seen in the female, proving therefore by their existence that they are not sexual muscles, and that the opinions of Mr. Wilson and Sir Everard Home, who believed them to be so, were erroneous, whilst there can be no doubt of their being intimately and essentially connected with the due retention and transmission of the urine. Taken as a single muscle, it has then two origins and five insertions, or six if the superior attachment of Mr. Wilson be considered double. When it acts, which it must do from its origins from the rami of the pubes, it can compress the urethra so as to close it I conceive completely after the manner of a sphincter; whilst from the attachments of the muscles, from their origin and being inclosed between the layers of fascia, they must also draw it towards the pubes. This muscle has a singular resemblance to the accelerator urinæ, situated outside the fascia, and is capable of acting, I am led to conclude, with great energy. The preparations are preserved in the Museum at the Ophthalmic Hospital, Chandos Street, Charing-Cross.

FIG. I.

View of the superior surface of the muscles, the bladder and urethra being detached from the pelvis.



1. A portion of the bladder.

2. Prostate, the posterior layer of the deep perinæal fascia being reflected off it.

3. The fibres of the muscles united crossing over the membranous portion of the urethra.

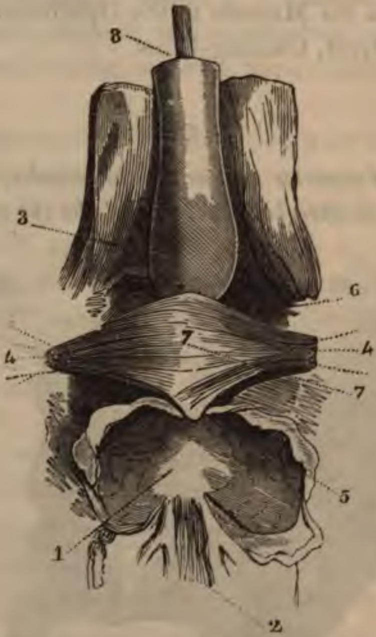
4 4. The legs of the muscles, separated from their attachment to the rami of the pubis and ischium.

5. Attachment of the muscles anteriorly to the corpora cavernosa.

6. Their posterior attachment to the fascia covering the prostate.

FIG. II

View of the under surface of the muscles.



1. Inferior surface of the prostate.
2. Portions of the vesiculæ seminales.
3. The bulb of the urethra.
4 4. The legs of the muscles.
5. Posterior attachment of the muscles.
6. Their anterior attachment.
7. The fibres from the two legs of the muscles meeting on the under surface of the membranous portion of the urethra.
8. Urethra with bougie in it.

Plate II.

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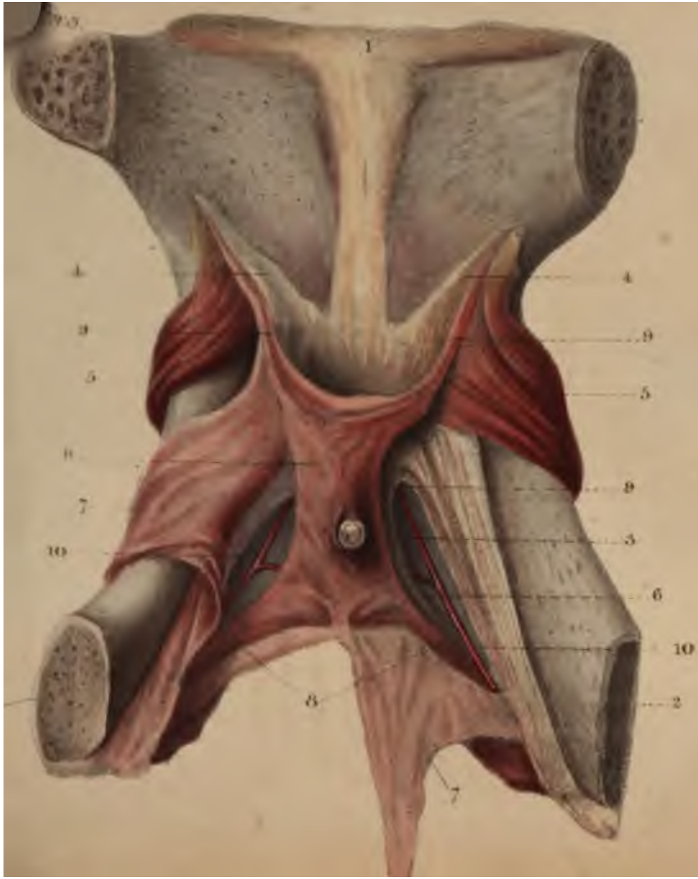


Fig. 4.

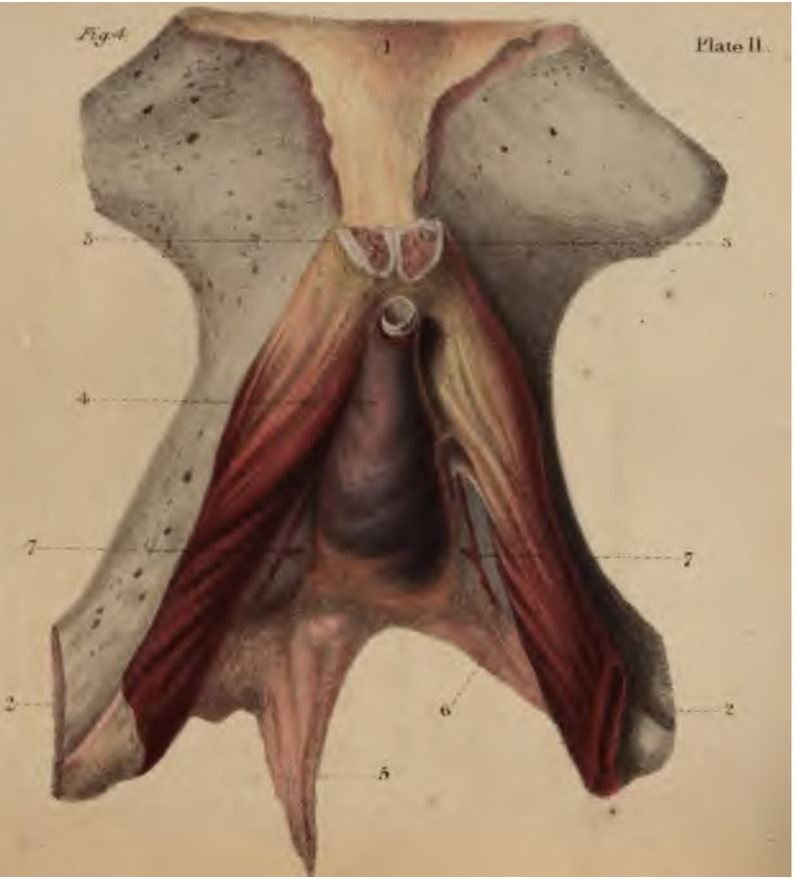


FIG. III.

View of the muscles from within the pelvis, the bladder being removed, and the urethra cut across anterior to the prostate.

1. **Inner surface of the symphysis pubis.**
2 2. **Rami of the ischia.**
3. **Urethra.**
4 4. **Tendons of the bladder.**
5 5. **Anterior fibres of the levator ani.**
6 6. **Anterior layer of the deep perineal fascia.**
7. **The posterior layer turned down on the right side to show these muscles, and turned aside on the left.**
8. **Origin of one leg of the muscle exposed.**
9. **Superior or Mr. Wilson's portion of the muscle running over the membranous part of the urethra, and closely connected with the fascia at that part.**
10. **The internal pudic artery.**

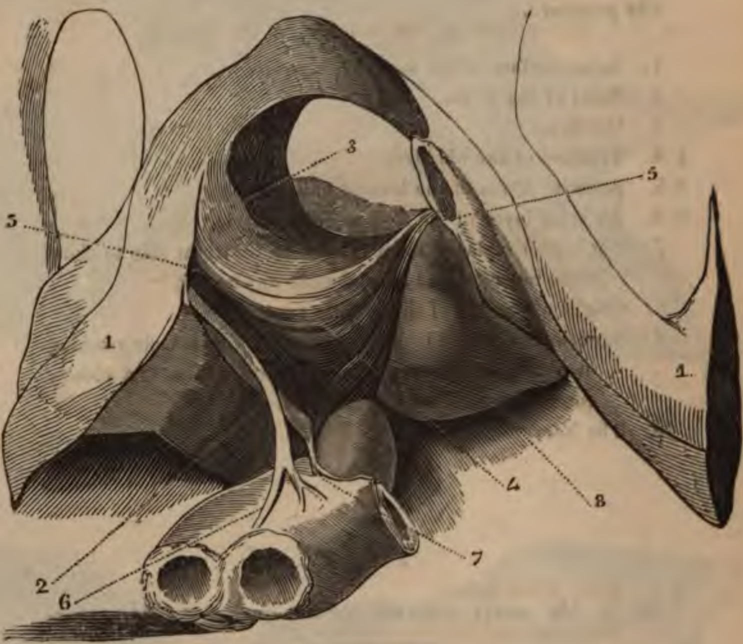
FIG. IV.

View of the parts external to the pelvis in the same preparation.

1. **The symphysis pubis.**
2. **The rami of the ischia.**
3. **The crura penis.**
4. **The bulb of the urethra.**
5. **The internal layer of the deep perinæal fascia seen at No. 7 of Fig. 3.**
6. **The anterior layer.**
7. **The pudic artery seen through it.**

FIG. V.

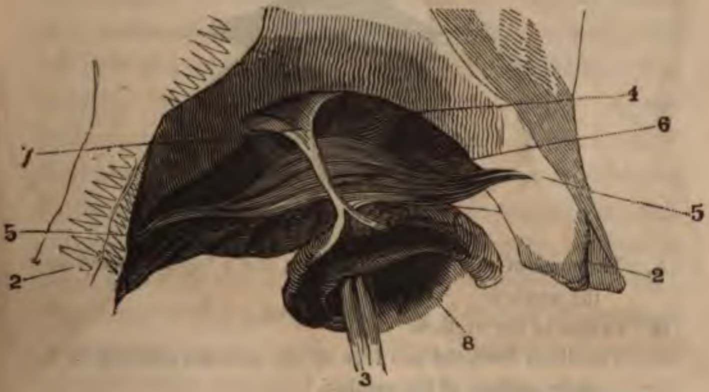
View of the muscles from the front, the urethra and anterior layer of the deep fascia being turned down.



1 1. Rami of the ischia and pubes.
2. Anterior layer of the deep perinæal fascia.
3. The posterior layer.
4. The muscles enclosing the membranous portion of the urethra.
5 5. Origins of the muscles.
6. Internal pudic artery dividing into its terminating branches.
7. The bulb of the urethra.
8. The prostate, both layers of the deep fascia on this side being removed.

FIG. VI.

Front view of the muscles in the female.



2 2. Rami of the pubes.

3. Bougie passed into the urethra.

4. The prostate.

5 5. Origins of the muscles.

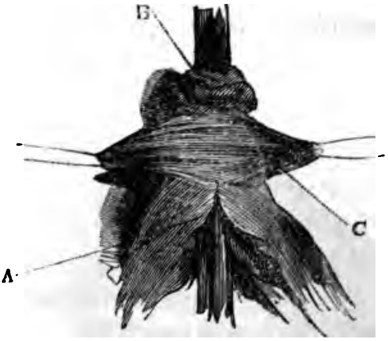
6. The fibres of the muscles passing over the urethra, attached posteriorly to the fascia, covering the prostate, and anteriorly to the point of junction of the corpora cavernosa.

7. Vena dorsalis clitoridis.

8. Corpus cavernosum of one side.

FIG. VII.

View of the under surface of the muscles in the female.



A. **The neck of the bladder cut open, and a bougie passed into the urethra.**

B. **Orifice of the urethra.**

C. **The fibres from the two legs of the muscles meeting on the under surface of the urethra.**

LECTURE IV.

THE urethra is termed membranous at the part where it is surrounded by the muscle I last described, and while it is posterior to the triangular ligament. On passing through this it obtains the name of the bulbous part or portion, in consequence of the bulb of the spongy body of the penis lying below it. In the preparation before you, the urethra is cut off on each side of the triangular ligament, in order to give a clearer view of the manner in which it passes through; the bones remain attached to it, and it is of the greatest importance to observe the different position the parts assume when regarded separately, as in the preparation, or with reference to the bones of the pelvis as that part lies on the table; or again, with relation to the pelvis in its natural state, when the person is standing erect or lying down. The situation of the opening in the ligament will be very much misunderstood unless the bones to which it is attached are placed in their proper position with reference to the body, when the inclination of the pubes forwards becomes obvious, and the obliquity of the descending rami, and of course of the triangular ligament is apparent. The depth at which it is situated from the external surface will be better understood in this view;

indeed no one can consider himself to be tolerably well acquainted with the anatomy of these parts, unless he has made several preparations like those now before you, demonstrating their structure and mutual attachments.

The urethra on passing through the triangular ligament, does not do so like the finger going loosely through a ring; on the contrary, it is attached to it, and the ligament sends forward a layer of fibrous structure, which surrounds and supports it. The bulb of the corpus spongiosum is applied to this on the under, but not on the upper part, and the bulb is again retained and fixed in its situation by the acceleratores urinæ muscles, which are attached to it, to the central point in the perinæum below, to the triangular ligament on the sides, and particularly above. These muscles do not appear to me to be usually described with the accuracy they deserve. They arise on each side, sometimes by a small pointed triangular tendon from that part of the ramus of each os pubis, where they may be said to be nearest to each other. When this tendon does not exist, they arise from the triangular ligament by fibres, which pass on with it to the same part of the pubes, although they are also firmly implanted around the bulb. The urethra on passing through the triangular ligament ascends, and during this ascent on the fore part of this ligament, which is for half an inch, it is firmly connected to it by additional ligamentous substance, which you see in this preparation firmly adhering to it. The acceleratores muscles, passing from the sides above the urethra, adhere to or are inserted strongly around this part, from which a white line extends upwards for about two inches, being the centre of a flat thin tendon formed by the two muscles, the under surface of which is applied to the urethra, the other or superior one to the crura penis, before they become corpora cavernosa penis, and afterwards lies beneath them, forming the under portion of the sulcus, in which the urethra is received in its bulbous part, and in a portion of that which is denominated spongy. From the origin of the muscles on each side of the bulb, the lowest fibres pass downwards to cover its inferior part; those arising higher up pass across, and those still higher up ascend, diverging as it were from their point of origin; the fibres of each side are seen meeting in a white central line, lying on the surface of the bulb, passing downwards to form the point of insertion in the perinæum, and running upwards on the urethra into a point where the muscular fibres on each side diverge from the urethra, and pass outwardly, with the object of running on the ligamentous covering of the corpora cavernosa to their ultimate attachment to that part. This muscle is not only a compressor of the bulb, but of the urethra immediately in front of it, which it surrounds by tendon on the upper half, and by muscle on the under half, the corpus spongiosum being interposed. If an incision be made in the line of union of the two muscles, and they be then turned outwards, the manner in which the tendon is formed, and which passes above the urethra to encircle it, will be distinctly seen. The bulbous portion of the urethra is only covered below by the bulb; the upper half is, as you see in this preparation, defended and maintained in its position by the ligamentous attachment I have described, connecting it in the firmest manner with the triangular ligament. The tendinous part of the accelerator muscle is its next defence, until it is received into the sulcus formed by the two corpora cavernosa, the ligament connecting these together being firmly attached to the pubes. The passage of the urethra from the opening in the triangular ligament is a gradual ascent to the point where the penis begins to become pendulous, when the urethra descends suddenly with it, and the line or curve separating the ascending from the descending or pendulous part is more formed by the attachment to the under part of the pubes, than, as is usually supposed, by the common suspensory ligament of the penis. If these points of attachment be attended to, the passage of instruments, be they straight or curved, into the bladder, is in a healthy state of the parts a very simple operation. They are guides, also, demonstrating the respective places at which the point of the instrument has arrived, and the course which it ought to take to attain its object, rendering therefore any computation of the length of the urethra useless as a guide in practice, although otherwise an object of curiosity. There is one urethra on the table eleven inches long, and another eight, and several of intermediate lengths, depending principally, it is true, on the pendulous portion for the difference, but not entirely; for the age and stature of a person, even after he has become an adult, often makes an essential difference when compared with another in those parts which are more fixed. I place no reliance whatever on the measurement of the urethra made after death, for, although the urethra may be then eleven inches long, as in the preparation before you, I never met with a case, unless there was a diseased prostate, in which a catheter ten inches long was required to draw water: on the contrary, one eight inches long will generally be found sufficient, and I have known one of seven answer well; the additional inches being usually gained by the elongation or stretching of the parts during life or after death; and if a surgeon calculates inches as his instrument proceeds, instead of considering the points of attachment as so many land-marks to guide his progress, he will be frequently in error, and always liable to do mischief. I believe the mistake of most consequence takes place in regard to those two parts which are called *membranous* and *prostatic*. In the preparation before you, in which the urethra is eleven inches long, the length of these two portions is near three inches. From the orifice of the bladder to the triangular ligament, the usual length of the prostatic portion is estimated at about fifteen lines, the membranous at about twelve, or something more than an inch for the prostatic portion, and perhaps a little less than an inch for the membranous. In this very urethra, eleven inches long, I have no doubt but a catheter nine inches in length would easily have drawn off the urine during life. I am satisfied that one of eight inches would have done it, and the membranous and prostatic portions, which now appear to be near three inches in length, would have been cleared by an instrument very little more than two; and this would occur from the manner in which these parts are supported and maintained against the pubes by the fasciæ, which attach and connect them and the surrounding parts to each other. When the prostate is diseased, on the contrary, the urethra at this part is made to undergo a considerable degree of elongation, and a catheter under such circumstances, should be longer and larger in the curve.

The length of the spongy portion of the urethra must always be uncertain, and is of no consequence. The orifice of the urethra when in a normal state is always vertical, and closed, the sides being applied to each other.

In addition to the excretory ducts to be found in the prostatic portion, two from Cowper's glands open into the bulbous portion. These glands are two small granular bodies, lying close but posterior to the bulb, yet separated from it by the anterior layer of the deep perinæal fascia. The ducts which you see in this preparation pass upwards and forwards for something more than an inch, opening in general on the under surface of the urethra, by orifices so small that you will rarely find them except by squeezing the secretion through them. They appear to be sexual glands, and not connected with the excretion of urine, inasmuch as they are to be found in the female in a similar situation, with regard to the fascia, as in the male. Mr. Taylor, who made the greater part of these dissections, has shown them on each side in this preparation, with the excretory ducts opening into the vagina. He thought he had made a discovery; for, although Dr. William Hunter in his great work on the gravid uterus has shown the orifice of the duct, he considered it as a follicle only. The older anatomists were aware however of there being a gland in this situation, before they knew there were any of a similar kind in the male. De Graaf mentioned, and Cowper notices them in his Anatomy of the Human Body, when he was unacquainted with those in the male which now bear his name. There are many other openings from secreting surfaces in the spongy portion of the urethra; these generally appear in the median line on the under surface, and are called *lacunæ,* although some large ones are to be found on the upper surface: one larger than the rest is called the *lacuna magna.* It is shown in this preparation, something more than an inch from the orifice of the urethra, and is often nearer two. The orifices of all these lacunæ are turned forwards, and may catch the point of a small bougie; the lacuna magna, from having more often done this, has obtained its name of *magna,* rather perhaps than from its size; and when this occurs the bougie must be withdrawn a little and the point borne against the inferior portion of the urethra, against that part situated just before where it enters into the glans penis, and which is called *fossa navicularis,* not that any very distinct fossa can be shown. There is however a follicle here which is apt to become inflamed, and give a great deal of trouble in many cases of gonorrhœa; and when its excretory duct becomes closed or impervious, which it sometimes does, it gives rise to a very troublesome disease of the prepuce, which shall in due time be described.

The width or diameter of the urethra is so very uncertain, varying so much in different people, that it is scarcely worth while inquiring into it, more particularly as the passage of instruments is always regulated by the size of the orifice of admission. Taking as an example a well-formed urethra, the orifice will be found to be the smallest part, with relation to every portion of the passage. I know but of one exception, and that is in some few people whose orifice is rather large; and in whom the narrowest part is situated in sight, and about a quarter of an inch within it. This is a natural formation, and the person is perfectly sound, but this part is also sometimes the seat of stricture, in which case it should always be divided with a small blunt-ended knife. The relief is immediate in the subsidence of the symptoms of irritation. From this part through the spongy portion the instrument will pass with perfect ease, until it reaches the commencement of the bulbous portion, where the urethra becomes a little narrower, and which diminution may become sensible to the hand. This bulbous portion of the urethra is said to be larger than the anterior part, but I do not believe that it is, although it may appear so from a slight contraction at the commencement of the membranous part, which makes it the smallest of all except the orifice, which is invariably the least, both as to diameter or circumference, when dilated by a round instrument. As to the positive size of the urethra, I can only say I have a solid bougie which is rather more than half an inch in diameter; I had it made for one gentleman in particular, and it passed with perfect ease through the whole passage. Very few urethræ will, however, admit a sound larger than from 12 to 16, this one is

No. 20 of my scale, and the dimensions of the urethra are not influenced by the size of the penis, as far as I have been able to observe. The orifice of the urethra is then, with the exception I have stated, the smallest part of the canal, and the least capable of extension, while every other part may be stretched to nearly twice its natural size without much difficulty, but the orifice scarcely yields without tearing, and this occurs from the peculiar dense structure of which its very edge is formed; a structure peculiar to the part, but in some degree analogous to that which forms the edge of the eyelid. If this be destroyed by ulceration, its value and utility is seen, for the part from which it has been removed contracts, and if the whole of the orifice has been deprived of its edge, the opening becomes so small as to act in a similar manner to a stricture, and to give rise to equally distressing symptoms, whilst it is also the most difficult of cure. The evil seems to arise from the unyielding nature of the cicatrix, and the resistance which it opposes to the bladder, rather than to the small size of the opening; for in many persons the orifice of the urethra is not situated at the end of the penis, but quite underneath, about the middle of where the frænum is usually placed, in which case the opening is always a small one, scarcely ever admitting more than a No. 6 bougie, yet stricture never occurs in these people but as a consequence of disease, capable of giving rise to it in others differently formed. The orifice of the urethra, even when in its usual place, is often much below the medium size. This is often caused by a sort of valve or hymen, which passes across the lower part, and can be readily shown by a bent probe, on which it may be protruded and divided in all cases in which it is necessary to introduce instruments for the cure of stricture or the removal of calculi. The orifice may also be unnaturally small, although otherwise well formed, when compared with the size of the canal within, in which case it must also be divided. I do it always with a small, sharp, but strong iris knife, carrying it directly downwards, but the wound is apt to heal if care is not taken to keep the edges apart by introducing a bougie from time to time to separate them. It was the custom of a surgeon, eminent for his treatment of strictures in this town, some twenty years ago, to break down the orifice in almost all cases in which it would not admit a No. 16 bougie. He did it by introducing a triangular conical shaped instrument, and pressing it on until the orifice yielded; it generally did so downwards, but not always, and the torn parts rarely united again; but the practice appears barbarous, and would not be submitted to in the present time. It enabled him however to introduce larger instruments than he otherwise could have done, and thereby to effect a more permanent cure than could have been accomplished if the orifice had remained untouched; for a bougie which passes with ease through a small orifice of this kind, must be much smaller than any other part of the canal, and cannot consequently dilate it to its full extent.

When the orifice of the contracted urethra is even enlarged, the portion of the canal which is before you, and behind it, is still the smallest part of the whole; and in selecting an instrument for examining the passage, you should choose one which will pass through this part with ease, and then, if well managed, it will meet with no obstacle in a healthy urethra in passing into the bladder, provided it has a proper curvature. The instrument I now show you is of solid steel plated, and was made by Mr. Stodart. In all common cases the patient stands before you, and you may introduce the sound with the convex part upwards, or with the handle turned towards the left groin, or with the concavity upwards. If the former, the instrument takes the course of the pendulous part of the urethra, and will be arrested by the bend the urethra makes in becoming so. This, which in people of small stature is often an insurmountable obstacle when the instrument is retained in that position, is easily obviated, and indeed avoided altogether by turning the handle of the sound gently round, until it becomes perpendicular or vertical, the concave side being turned towards the patient, and the handle kept close to the body. Retained in this position it is to be steadily yet gently pressed on until it appears to meet with an obstacle, or rather not to proceed, when if the handle of the instrument be lowered or brought directly downwards, the point of the instrument will slip into the bladder. If the surgeon has any doubt of the fact, he may ascertain it by bringing down the handle until it falls in a line drawn between the patient's ankles, when if he feels that the point is free, he may be satisfied it cannot be anywhere else, unless he has used a degree of violence quite unsurgical, as well as unbearable. If on lowering the handle the point will not pass on, the handle must be again raised, carried close to the abdomen, and gently pressed again a little further into the urethra than it was before; when on lowering it once more, it will slip into the bladder. These are the directions I give to gentlemen after they are cured of stricture, and I never fail to enable them to pass a bougie for themselves with ease. The natural obstacles, as they are called, which are to be met with after passing the bend caused by the pendulous part are two; one, according to Mons. Amussat, is caused by a fold of membrane passing from the urethra to the pendulous portion of the bulb; the other by the edge of the triangular ligament which passes under the urethra. These are avoided by keeping the urethra on the stretch, after the handle of the instrument is placed in the vertical direction, until it is lowered, and by bearing the point of the instrument against the upper surface of the passage. If the handle of the sound is lowered too soon the point is borne against the triangular ligament at that part where the urethra is firmly attached to it. This error is immediately perceived and as soon rectified; but if in gently passing the instrument on, it be too heavily pressed downwards, whilst the urethra is not sufficiently on the stretch, the point is carried below the inferior edge of the triangular ligament going under the urethra, and cannot proceed until it is extricated from this situation, which is to be done by withdrawing the sound for the space of an inch, then bearing it steadily forwards, and against the upper surface of the urethra, until it has passed the obstacle. I had a man in the York Hospital in whom it was impossible to pass a sound but in one way, and then it was very easily done. I tried several surgeons, but none could succeed until I showed them the method of doing it, which I discovered by accident. It was to carry the point of the solid sound or bougie down to the obstacle, then withdraw it for an inch and pass it forwards; this never failed, but half an inch never succeeded, nor any less distance, however well the efforts were made in any other direction. You saw an instance this morning of an obstruction of this nature. The person came into the hospital unable to pass his water but by drops. He thought he had false passages, and all sorts of things besides; and it was really a difficult case. I can now pass No. 15, you have seen me do it several times, yet it met with obstructions each time, which rendered it necessary to change the direction of the point of the instrument; and a person not acquainted with this case might readily fail in passing even No. 5, and conclude that the patient had a very narrow stricture. These obstacles are formed however by unyielding parts external to the thin membrane of the urethra.

The two urethræ before you have been taken out with the triangular ligament, which has been separated from its attachment to the bones; and they have been slit open on their upper surfaces. If the points of attachment of the triangular ligament are held steadily on each side, and the urethra is put on the stretch, you see most clearly the ridge the ligament forms under the urethra. If these attachments are left loose, whilst the urethra is stretched by the left hand, the other end or bladder being held by another person, and the fore-finger of the right hand is run along the under surface of the urethra, it will meet with a little depression or fold which impedes the progress of the finger, and nearly in the same situation; this M. Amussat affirms, causes the obstacle met with in passing a bougie, rather than the triangular ligament. This fold is formed, according to his account, by the interior fibrous membrane of the corpus spongiosum, which passing outwardly where the bulb separates from the urethra forms a sort of bridle around it; but I suspect he is mistaken in attributing so much to it. When a side view of the pelvis is made, as you see in this preparation, the attachment of the triangular ligament is cut away on the left side, the resistance it would otherwise make is obviated, and the point of the instrument is only seen to catch on the fold in question if the point is borne steadily against the under surface of the urethra. If you will make, gentlemen, two dissections, one a front view of the triangular ligament, carefully removing all the parts around it, except the urethra, the other being a side view of the pelvis, you will more readily learn how to pass instruments into the bladder, and to note the obstructions, than by any other means.

If a straight instrument is to be passed into the bladder, the horizontal position of the pubes is to be remembered, and the attachment of the urethra to it through the triangular ligament, for the extent of its bulbous portion. By raising and gently stretching the penis, the urethra may be brought into a straight although an inclined line, commencing at the orifice, but not going on to the bladder. On the contrary, it passes through the membranous part of the urethra only, and terminates at that part which is embraced by the transverse portion of the prostate, against which, even if it escapes the other obstacles before alluded to, it is sure to strike. In a healthy urethra, by withdrawing the point a little, by letting the penis loose, and by a dexterous lowering of the handle, the attachment of the upper surface of the urethra to the triangular ligament being thus made the fulcrum, the point is tilted over the anterior edge of the prostate, and then passes readily into the bladder. It is sometimes however necessary to introduce a finger into the rectum to effect this object. When a straight sound is passed, the patient should be laid on his back, with his legs drawn up, and his body a little bent forwards, to favour the formation of an inclined plane of the urethra. The rectum should be previously emptied, that the prostatic portion of the urethra may not be elevated.

When the patient has an enlarged prostate, and the urethra behind the triangular ligament is lengthened, as well as altered in its direction, the catheter should have a different shape from the common one. It ought to be fourteen inches long, a No. 12 in size, quite round at the point, with small round holes at the sides of the end, and with a large curve. It should be passed down to the obstacle for the purpose of ascertaining the distance only. This being done it is to be withdrawn a little, and as the patient lies on his back, with his legs drawn up, the shoulders being a little supported, the point is to be hooked beneath the pubes, the shaft of the instrument making a right angle with the body; the surgeon now makes his calculation, not as to how many inches, but as to the exact situation of the point of his instrument, which should be just entering the membranous part, and yet be past the triangular ligament, and so far clear of the bone, although hooked against it, that it will on depressing the handle of the catheter, carry the upper surface of urethra as near as may be against the inner surface of the pubes, and by this manœuvre ride over the enlarged portion of the prostate, which we will say, generally speaking, does not surround the upper part of the urethra, and therefore admits of this being done. To do this, the concave, or upper surface of the catheter, must be firmly applied to the under surface of the pubes, from which position it slips upwards, or towards the wall of the abdomen, as the handle is depressed. If the point be allowed to advance, by quitting the pubes, it will only get into the bladder by passing through the substance of the prostate, which sometimes happens, and does less mischief than might be supposed, as it is frequently only discovered after death. This act of depressing the handle must be steadily done, it also requires some little force and more dexterity, and will not always succeed on the first attempts. The patient and the surgeon have both a great stake at issue, for if it does not succeed, and a gum-elastic catheter is not more successful, the bladder must be opened, either above or below the pubes. So much for the present, gentlemen, of solid instruments; let me beg of you never to miss an opportunity of passing them; it is practice only can give dexterity.

LECTURE V.

I CONCLUDED my last observations on the use of the prostate catheter by showing you the instrument; but you must recollect, that it is only particularly serviceable in those cases of enlarged prostate which are distinctly well marked, and occur in elderly men. The shape is in every respect like that recommended by Sir Astley Cooper, of whose prostate catheter it is a model. In those derangements of the prostatic part of the urethra, and of the neck of the bladder, which are frequently met with in younger persons, an instrument with a different curve is preferable and passes much more easily. It will indeed pass often with ease when the prostate catheter will not. I call it No. 2, prostate catheter, to distinguish it from the other which is No. 1. It is shorter and straighter, with an inclination to curve at its extremity, rather than actually curving like the other. It has a small wooden handle with two eyes, in order that it may be tied in readily if necessary, and it is strengthened by a stillet of what is called flexible but stiff metal by the instrument makers, having a ring at the end, by which it may be the more readily withdrawn. This particular curvature I obtained after many trials with a flexible metallic instrument, and I believe it to be the best. The instrument I now show you is the third kind I commonly use. It is merely a solid iron sound polished, of a particular curvature, having a small wooden handle, the last inch and a half towards the point being gradually diminished in size, so that if the shaft of the instrument be as ten, the point shall be eight. You should however have others of the same size throughout, and I have them on the contrary made a little bulbous, an inch or two from the point, for particular use. This third kind of instrument should be plated, or gilt if you please for dandy gentlemen, which prevents their getting rusty; they also look prettier, and a man submits much more readily to the use of a silver instrument than he will to a piece of cold steel, however well polished. There is a great deal in imagination in this world, and if after having passed a silver sound some twenty or thirty times for a patient, you finish your proceeding with a gold one, I assure you he does not forget it. I do not happen to have a gold one myself, but I think I must get one, for gold for gold is but reasonable.

An instrument of this shape passes through a healthy urethra without stop or stay. It meets with no obstacle when managed by a surgeon conversant with the attachments of this canal, and it passes so easily and with so little pain and inconvenience, that the patient scarcely believes it has been introduced when it has been withdrawn. A well-oiled instrument of a proper temperature a size or two less than the orifice of the urethra, will pass through it to the astonishment of the patient, when a small soft and pointed wax bougie will catch on something at every inch. A gentleman, who had been using small bougies of this kind by himself, came up to me from the country, declaring he had an impassable stricture, which rendered him miserable, for although he could make a tolerable stream of water he never could pass the smallest bougie in his possession, and he had great fears for the result. Finding that he could make a fair stream of water, I selected a No. 8; it went with ease: I then took a 12, it went as easily: a 14 followed as readily. The gentleman declared it was done by magic, whereas it was merely done by virtue of an instrument of a proper shape and size.

The two prostate catheters should also be made of a soft metal, which is I believe called pure tin by the instrument makers. It was formerly a patent composition or something like it, and bougies were made of it for common use; but I disapprove very much of the construction of small and pointed instruments of any kind of flexible metal, for they are not only apt to break but to bend, and deceive the surgeon or person who is using them, by inducing him to believe they are passing on when they are only bending. I am quite sure that the greater part of the false passages, which have been made in the urethra, were made by metallic or flexible bougies, and I look upon them as very dangerous instruments: a surgeon always knows what he is about with a solid one, he never knows exactly what he is doing with a flexible one, if any pressure be required with it. When it becomes necessary to keep a prostate catheter in the bladder for several days, it ought to be made of flexible metal, which lies in it with much more comfort to the patient; for it takes on the form of the parts and accommodates itself to them in a manner a silver catheter cannot do, whilst the handle may also be bent down out of the way, instead of standing directly out and striking against every thing, as a silver one necessarily must do. A metallic flexible prostate catheter will not however pass like a silver one, its flexibility prevents its point being duly acted upon by the motion of the handle; and in all cases of difficulty the silver one should be passed first, and allowed to remain for twenty-four hours, when the metallic one will generally follow, the obstacle having been in some degree removed or flattened, which allows the flexible instrument to rise or ride over it.

There is a great difference in the manner of using a metallic or flexible bougie, or even a common wax one, and a solid sound. I have already shown the way in which this latter is to be managed, and have drawn your attention to the fact of its point mounting, or riding over an obstacle, by the motion which is given to its handle. It is in consequence of this that it surmounts or eludes all the obstacles to be met with in the canal, and which surgeons have been pleased to call natural, but which are really only called forth by the use of an improper instrument. The round point of a solid sound or bougie, is always readily carried along or borne against the upper surface of the urethra, the point of a flexible instrument will almost always and unavoidably be carried along the under surface of the urethra; and as all the parts which can cause obstruction, except the lacuna magna, are to be found on the under part, it must necessarily meet more readily with them; especially as the passage of the flexible instrument is effected by a steady pressure of the finger and thumb, without any but a forward motion being communicated to the point. This is the cause of the frequent failure of a soft or flexible bougie, whilst a solid one will pass with ease; but you must be made aware, that when the curve of the solid bougie does not correspond with the opening of a stricture, and which occurs most frequently in short persons, in whom the curvature of the canal is greater for their size than in taller persons, a soft wax bougie will often pass much more readily, and is to be preferred. I have a gentleman at this moment under my care, who has had a stricture for thirty years, and is a great performer with metallic bougies; he cannot pass his metal one at all now that the stricture is narrow, whilst I can pass a soft wax one of the same size with ease. This he cannot comprehend, and I will not tell him why. Metallic bougies then I do not use, metallic catheters I do in certain cases, but only in them, relying in most others on solid instruments, which will not easily break, and do not readily deceive as to their motions and the progress they are making. Catheters made of caoutchouc are very valuable instruments, both in cases of mere retention of urine when it is necessary to draw the water off to give relief, and in cases of diseased prostate; but as they cannot always be passed with an iron stillet, which whilst it preserves the form the surgeon may think fit to give them, deprives them of their flexibility; many surgeons, and particularly Sir E. Home and Mr. Brodie, have recommended their being kept for a long time upon the curved iron stillet, so that when taken off they may in a great measure retain that degree of curvature which has been found most sucessful in passing over a diseased prostate; and which curvature can always be increased or diminished, and the direction of the point altered, by pressure with the point of the finger on the rectum or perineum. No. 4 in the accompanying wood-cut is the elastic catheter on the stillet, and of that curvature which will when the stillet is removed bring it to its proper form for use, and which it will for a time retain.

You should have two kinds of wax bougies for use, one soft, so as to be capable of taking an impression with ease, the other made of harder materials, so as to take any form you please when slightly warmed, but which still opposes a good deal of resistance to pressure. Catgut and elastic gum bougies and catheters of various sizes, will complete your common surgical apparatus. Of other and more complicated ones we shall speak when we have noticed the remaining part of the urethra, and the diseases for which they are *especially* intended.

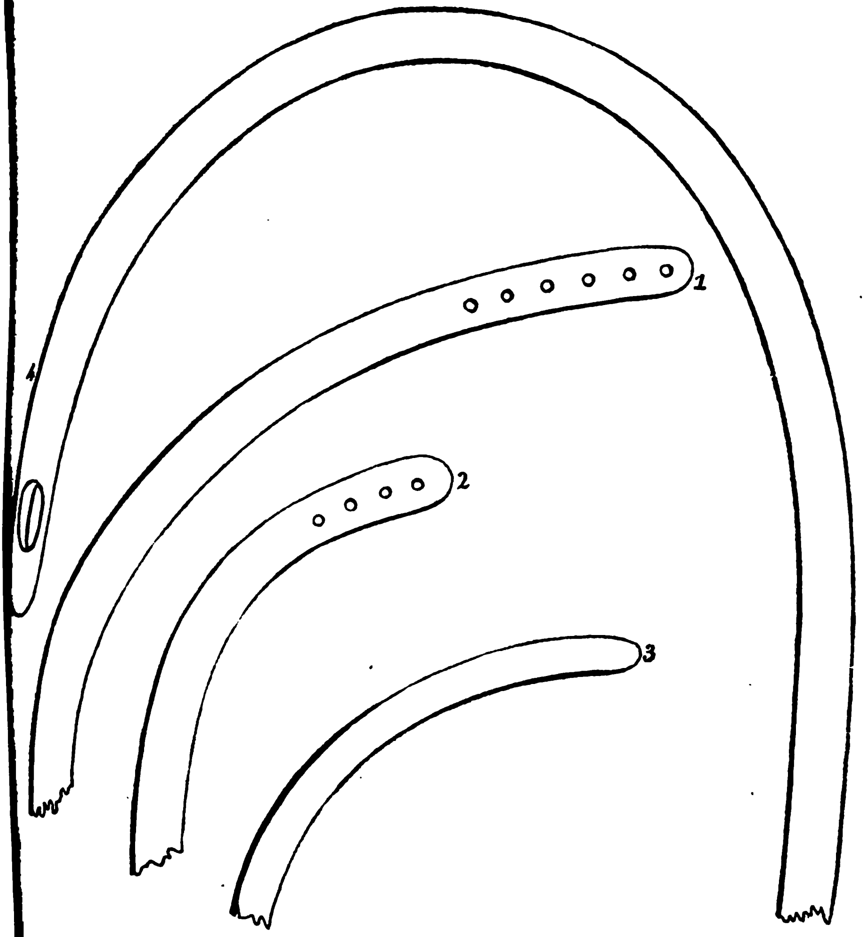


Figure 1. Prostate Catheter, No 1.
Figure 2. Prostate Catheter, No. 2.
Figure 3. Common Solid Sound, or Catheter, No. 3.
Figure 4. Elastic Catheter, or its Stillet, No. 4.

LECTURE VI.

WHAT is the urethra? This question, I presume, you all think you can answer without a moment's hesitation. It is, however, a most difficult one, which I cannot solve without some circumlocution. Is it the canal itself through which the urine passes? Upon that point you will say there is no doubt; but is it not also the wall which bounds and forms the canal? Is not the word used surgically in that sense? You will admit this also without hesitation; and now then gentlemen, will any of you tell me of what the wall, or substance which forms the tube is composed? Be pleased to read over the last twenty authors who have written on the subject, and you will not find two of them quite agreeing in opinion; some say it is one thing, some another, and others shirk the inquiry altogether; yet it is a very important one with relation to the means to be adopted for the cure of some of the diseases which affect it. It is admitted by all parties, that the inner lining is cuticular, and covering a mucous membrane, which is also elastic, and endowed with great and peculiar sensibility. But some, with Mr. Hunter, Sir E. Home, and Mr. Wilson, suppose this to be a muscular coat also, composed of muscular fibres, so small as scarcely to be detected by the microscope, and united to each other by mucus instead of tendons, a state which may exist, but which I do not comprehend. Others again consider these muscular striæ to be merely a vascular arrangement, or to be the elastic fibres of the membrane itself. All parties however appear to me to consider the wall of the canal to be similarly composed in its whole length, which I apprehend to be a source of error, there being three great divisions, very differently circumstanced as to structure with relation to the surrounding parts. These three divisions are the prostatic, the membranous, and the bulbous and spongy parts of the canal. The two first I have described; and your attention will at once be drawn most forcibly to the great difference which exists between them, when I state to you a fact which is acknowledged by almost all surgeons of experience, namely, that the prostatic and membranous parts are not usually the seat of stricture, which is confined to the anterior part of the urethra, or that portion which is co-existing with, and anterior to the triangular ligament, and is called the bulbous and spongy part. The membranous part of the urethra is so called I believe, because it may by dissection be readily reduced to its internal membrane alone. I have demonstrated to you a peculiar muscle which surrounds it, which I have no doubt compresses and closes it so as to act as a sphincter, the true nature of which had been overlooked; but the contraction of this muscle which surrounds this part of the urethra in so evident and perfect a manner does not often give rise to permanent stricture.

It may compress any thing introduced into the canal aud flatten it; it may render the canal impervious when strongly excited, but it does not remain permanently contracted or give rise to continued stricture or obstruction. The urethra at this part, membranous as I have described it to be, and capable of being reduced to a single layer of mucous tissue, is not applied in this state to the inside of the muscle. There is a quantity of condensed cellular and fibrous structure between them, so that the wall of the canal is not only here composed of a cuticular, a mucous, and a vascular layer, but of an external covering of fibro-cellular structure, something resembling the coat of an artery, and by which it is connected to the sphincter or compressor muscle. It passes through the triangular ligament in this state to meet the bulbous portion of the urethra, and it is rarely, except when it meets with this, or is surrounded by the corpus spongiosum, that strictures are found in disease; unless they are of long standing, have given rise to much external mischief, and have been propagated by repeated attacks of inflammation in a contiguous structure. It appears therefore a reasonable deduction, that it is in consequence of something which is added rather than on account of something which is taken away, that this propensity to disease takes place.

I have described to you with some precision the origin and attachments of the accelerator urinæ muscle, and particularly that part of it which surrounds the urethra immediately anterior to the triangular ligament; and as this part of the urethra is commonly the seat of permanent stricture, an irregular action of this muscle is supposed to have much to do with its formation. If stricture existed only at this part, the inference would be a just one; but stricture often takes place at the orifice of the urethra, and for two inches backwards, to which parts no fibres of this muscle extend; and the membranous portion of the urethra, which is surrounded by a muscle acting as a sphincter, and whose description I have given at length, is supposed by most persons to be free from this disease in the greater part of its extent. If then the part posterior to the accelerator is free from stricture, although more intimately and closely connected to and surrounded by a stronger muscle than the accelerator, when compared with the space it covers; whilst the very anterior part which has no muscle at all is affected by stricture, I think it must be admitted, that the action of the accelerator muscle cannot be the cause of stricture in the intermediate part. In the horse, the accelerator muscle surrounds the whole of the urethra anterior to the pubes, nearly up to its orifice, and its action is assisted by the two retractor muscles which lie upon it; but in man the accelerator does not continue along the under part of the urethra to near its extremity. Now if the horse had stricture at this part, and the man had not, then it might be fairly attributed to the action of this muscle; but as this is not the case, the undue action of the accelerator urinæ, or ejaculator seminis, as it is also called, can only be supposed to keep up and increase the mischief, when the parts within are inflamed or irritable; but it cannot alone give rise to permanent disease.

The whole anterior portion of the urethra, or that part in which stricture is usually situated, is surrounded by the corpus spongiosum; and it is to it that I am disposed to attribute the principal share in the formation of the worst kinds of permanent stricture, and the great difficulty which is experienced in effecting a perfect or radical cure. When the membranous portion of the urethra passes through the triangular ligament it preserves its fibro-cellular exterior, and more particularly at the upper part to which the bulb of the corpus spongiosum is not applied; but when the corpus spongiosum does surround the urethra, this external fibrous cellular covering leaves the internal mucous membrane, and is attached to, and merges in the elastic structure of the internal layer of the erectile tissue of the spongy body; to which the mucous membrane is so intimately attached as to be separated only by scraping with considerable care; and thus destroying the shreds of attachment between them, which are in some places more strongly marked in the general cellular attachment than at others. At the part, where the urethra enters the glans, the erectile tissue is thinnest, the urethra is nearer the surface and is supposed to be wider. Some large follicular glands are situated at this part, which is called the fossa navicularis, and are prone to enlargement, terminating occasionally in the formation of fistulæ in the prepuce of a very troublesome nature, but is not often the seat of stricture. Here are three dissections of these parts, illustrating what I have said. The thinness of the internal membrane, and its attachments to the elastic internal layer of the spongy body, are well shown in each.

The manner in which the urethra enters the corpus spongiosum is also evident, and the highly vascular texture of the bulb and spongy body is also shown by injection from the internal pudic artery. It is nearly as red as the inside of the stomach of an infant. The whole corpus spongiosum, including the bulb, seems to be formed originally in two symmetrical halves or parts, and to unite to form one body, much after the manner of the corpora cavernosa penis. In some of the dissections made by Mr. Taylor, the septum, in the centre of the bulb, is well shown, and may be traced along the corpus spongiosum; but these parts still require a closer investigation. The elasticity of the urethra when surrounded by the corpus spongiosum, is best shown by introducing a solid sound into it, when by turning the point downwards, it may be stretched to a considerable extent in every direction. This may be done in the living body without giving pain, with the exception of the orifice of the urethra, which will yield but little. If the person should have an old narrow permanent stricture at the distance of three inches from the orifice the experiment is made most conclusively, for the urethra stretches at every part anterior to it with great ease; but when the solid sound reaches that point it can penetrate no further, the elasticity of the part is lost, the hardened obstacle formed by the stricture is distinctly felt from the outside; and by a little turning downwards of the sound, its point can be felt through the external parts projecting below the obstacle and carrying the urethra before it. If a sound just large enough to go through a stricture of this kind is passed, and the part is examined between the finger and thumb, the extent of the stricture may be easily ascertained by the hardness, which is quite peculiar and distinct from the natural structure of the part either before or behind it. If the instrument is withdrawn and the same spot is again examined the hardness will be very perceptible, when compared with the soft elastic sensation communicated by the spongy body in its natural state. The hardness is sometimes like a cord, and occasionally when circumscribed, like a small hazel nut. In the erectile state this hardened part is not augmented in size, although the spongy body is distended before and behind it; whilst it remains a stationary hard line or spot, connecting the two distended parts together, and when the stricture is in an irritable state often giving pain. If this hard part be cut into, the corpus spongiosum seems to have lost its spongy appearance, its erectile texture has become consolidated, and resembles rather a solid gristly substance than an elastic structure. This kind of disease is very apt to form when the urethra is ruptured, during the severity of what is termed a chordee. It yields to the distending power of the two erectile bodies, and the inflamed part which has lost its elasticity is torn; the tear extends into the spongy body itself, blood flows freely from the orifice of the urethra, and the cells of the corpus spongiosum around the rupture become loaded with it. Inflammation follows, and without great care be taken in the treatment, a permanent stricture is the result. Old Heister used I believe to recommend that when a chordee was troublesome, and the part had an undue curvature, it should be cured like many other obstinate things by beating it straight, in which operation the urethra was usually ruptured, when the flow of blood relieved the symptoms for the time, to cause perhaps a more permanent evil.

When the mucous membrane is inflamed, and has lost part of its elasticity, it does not always yield as readily under distension as some of the interstitial parts of the corpus spongiosum; which when they give way, allow the blood to be effused in the strict sense of the word; and a soft swelling takes place, which is a sufficiently remarkable although not a very common accident. I have just now under my care a young gentleman, who has a soft swelling of this kind about two inches and a half from the orifice of the urethra, and which appeared suddenly. The urethra was inflamed at the time, but was not ruptured; a full-sized bougie could and can be readily passed along it. It gradually altered its appearance, became less, and would I think have gone away altogether, had not another gonorrhœa supervened, which by adding new symptoms, has rather increased than diminished it, and without great care a stricture will possibly be the result. In a case which I treated many years ago in the York Hospital, the swelling situated in the same place was as hard and as circumscribed as if a Barcelona nut had been inserted into the under part of the urethra. It was quite cartilaginous to the touch, and the man made his water almost by drops. I removed this disease by the repeated but careful application of the argentum nitratum, so that no signs of it remained externally, the hardness having gradually diminished until it went entirely away. The man, a soldier, was to have been discharged, but on leaning over his bed to fold up the blankets one morning, he fell forward dead. I opened him next day, and found his heart diseased. The urethra appeared quite sound, and to my great surprise nearly as much so at the part which had been affected as any other. I had a preparation made of it, and it is or ought to be in the museum at Chatham. Lest you should go away with the impression that a stricture of this kind may always be cured by caustic, I must mention to you the case of a gentleman who consulted me a short time afterwards. He had a similar swelling situated at the part where the scrotum joins the penis. I was delighted to have the case, and felt assured of a similar termination, but no such thing took place; the swelling and hardness increased rather than diminished, and at last I was obliged to divide the part from without inwards to save his life, by giving free passage to his water. I have since had many other cases of a like nature, all of which have been treated and relieved with various degrees of success, but none so pre-eminently well as the first. You will ask me perhaps, why? I can only say, it is as difficult to answer you on this point, as it is to tell you why in some cases of almost impermeable stricture a permanent cure is effected by simple dilatation, whilst in others as nearly alike as possible, the relief obtained is only temporary. It depends on the various shades of distinction between diseases, and on the particular extent to which each peculiar structure is affected. Experience assisted by careful observation may enable us to select the best and least dangerous mode of treatment, but it has not as yet enabled us to mark all the distinctions and shades of difference between these diseases, which it is necessary we should know to arrive at a more perfect knowledge of their treatment.

In repudiating the opinions which have been entertained of a muscular structure of the membrane of the urethra being the cause of contraction in this part; you must not suppose from what I have said, that it is entirely attributable to the elastic structure of the corpus spongiosum. I have demonstrated to you, contrary to the received opinion of modern surgeons, that stricture takes place at the neck of the bladder, at the inner end of the urethra, to which part the corpus spongiosum does not reach by a considerable distance; it cannot therefore, when in this situation, be attributed to it; and all that can be admitted is, that the corpus spongiosum contributes largely towards rendering a contraction more permanent and more difficult of cure. I can flatter myself that I have told you why a stricture may be more obstinate, more permanent, and more difficult of cure, where the urethra is surrounded by the corpus spongiosum than where it is not so situated; but I cannot flatter myself that I have told you why those parts of the urethra which are called membranous and prostatic, are free or nearly so from this contraction or stricture which is so common in every other part. If the membrane of the urethra at its vesical end, or the very commencement of the bladder itself, connected only with cellular structure, or a few muscular fibres, can in any cases, however few, become hard and inelastic, so as to form a bar or stricture; it is quite plain that the very membrane itself must possess some properties, the deprivation of which leads to the evil; but of which properties it is possible it might not be deprived by a cause exerting an influence of the same extent and degree if it were dissimilarly connected. For instance, low inflammation at the neck of the bladder may produce contraction and loss of elasticity there, when it cannot do so a few lines more forward, where it is nearly surrounded by the prostate gland; and active inflammation as well as chronic may give rise to it in that part of the urethra which is surrounded by the corpus spongiosum; whilst it does not generally do so in the membranous part, which is enveloped only by a fibro-cellular and muscular structure. In this statement you will perceive I admit that the membranous part of the urethra does not usually originate a stricture, but I do not affirm that it is always free from that complaint, or that it is not communicated to its anterior part by continuity of structure and extension of disease.

The loss of the elasticity of these parts is to be accounted for, and my belief is, that it is caused by inflammation in all its various shades and stages. In this I support the opinions of Sir C. Bell, Mr. Shaw, and others, against those of Sir E. Home, Mr. Wilson, and those authors who have directly or indirectly taken a different view of the question; and attributed the contraction to a wrong action of muscular fibres which have not been satisfactorily shown or proved to exist. The most remarkable fact on this point I have stated, *viz.* that in the membranous part of the urethra, which is known to be surrounded by a very powerful compressor muscle, the advocates for muscular contraction admit that permanent contraction does not usually take place; and if it does not take place there, it is and will be difficult to prove why it should occur from that cause anywhere else.

The urethra is scarcely sensible to its natural stimulus when in its normal state; but when it is affected by inflammation or irritation its sensibility is so greatly augmented and its sympathies are often so peculiarly developed, as to excite intense anxiety and suffering. The appearance of the urethra when the canal is slit open varies a little in colour; during life there can be no doubt of its being of a bright red, which arises from its great vascularity, a fact easily ascertained by separating the sides of the orifice. This redness gradually diminishes in intensity in the course of the urethra, and after death it disappears; and the inside of it is found more or less of a light yellowish colour, deepened or redder at those parts which in general possess most sensibility when in a state of irritation. Thus the bulbous and membranous portions, and particularly the bulbous, are of a reddish colour, whilst the prostatic part is of a pale yellow; yet that and the neck of the bladder, the colour of which is equally pale, are often most acutely sensible.

The surface of the urethra in a state of health is lubricated by a secretion of mucus sufficient to defend it from the irritation of the urine; but not so abundant as to flow from the orifice, the edges of which are scarcely more than moist, unless some irritation greater than usual has taken place in the canal. It is secreted in all probability by the whole mucous surface, but particularly by the various lacunæ which are distributed throughout; and which seem to pervade especially the most sensible parts. Those situated in the fossa navicularis, about an inch from the orifice, are often the cause of much inconvenience, both from abscess and from increased secretion. The orifice of the urethra is not a round opening, but rather resembles a mere slit, from the edges being applied to, or in contact with each other, a state which is supposed to exist throughout when the parts are quiescent. When the erectile tissue is distended, the urethra is elongated, the sides are separated from each other, and the canal becomes more or less enlarged or round. It is only fully distended by a continued stream of urine.

The urethra thus formed is a tolerably strong canal, and not liable to be perforated by instruments introduced into it, when they are used with dexterity and moderation. Like every other part of the body it is liable to abuse, and there is nothing which may not be done to it by ignorant and violent men. Of the various parts of it, the membranous portion has usually been supposed to be most easily and most frequently torn; I am convinced, however, from repeated dissections, that this is not the case; that false passages usually begin in the bulbous portion, and pass by the side or under the membranous part towards or into the bladder; or they begin at the termination of the membranous part, and pass through the prostate. Mr. Powell, of Great Coram-street, when surgeon to St. Clement's workhouse, was so good as to give me a prostate which had five openings through it from the membranous part of the urethra into the bladder, made at different times by the catheter, and which gave little comparative uneasiness, the person dying at last of an acute disease, I believe of the chest.

LECTURE VII.

In supporting the opinions of Sir C. Bell, Mr. Shaw, and others, with respect to the urethra being elastic, in opposition to those maintained by Mr. Hunter, Sir E. Home, Mr. Wilson, and those anatomists who have considered it to be muscular, I am forced to confess my dissatisfaction at the explanation they give of the manner in which the various changes take place, constituting disease. It appears to me, and I admit my great liability to err in understanding the opinions of others, that these changes cannot occur from *inorganic elasticity* only, or the same kind of property which is found in Indian rubber; and that it is necessary something should be added, to enable us clearly to understand the subject matter before us. I am led therefore to make a distinction between the common elasticity residing in a spring, or in Indian rubber, and the *vital* elasticity which exists in all the elastic parts of the human body, and by means of which the various changes that take place may be more easily comprehended. The first principal change to be noticed, and which bears particularly on this point, is the state of contraction of the canal impeding or even preventing the passage of the urine, and which has been divided into *spasmodic* and *permanent*.

Mr. Hunter assuming the fact, that the urethra was muscular, supposed that the first derangement leading to, or causing contraction, arose from a spasmodic action, producing a degree of contraction beyond the natural, and which he called a spasm, and the complaint a spasmodic stricture.

When the part, thus contracted, became incapable of falling back into a state of complete relaxation, and the canal remained always narrower at that part, he considered it to be both a permanent and spasmodic stricture. So far permanent that it is always narrower than the rest of the canal, and so far spasmodic that it is liable to contract occasionally in a still greater degree; and he supposed both the spasmodic and permanent state to be caused by a contraction of the transverse fibres of the membrane which forms the canal.

Sir E. Home, in consequence of the microscopical observations of M. Bauer, was led to take generally a similar, although in some respects a different view of the matter. He supposes the urethra to be composed of two parts; a fine internal membrane, which is not fibrous, but which, when collapsed, is thrown into longitudinal folds, and an external muscular one, composed of very short fasciculi of longitudinal fibres, which appear to be interwoven together and to be connected by their origins and insertions with each other. The fasciculi being united to each other by an elastic substance of the consistence of mucus.

" A spasmodic stricture," he says, " is in reality a contraction of a small portion of the longitudinal muscular fibres, while the rest are relaxed; and as this may take place either all round, or upon any side, it explains what is met with in practice, and which could not before be satisfactorily accounted for; the mark or impression of a stricture sometimes forming a circular depression upon the bougie, at others only on one side.

"A permanent stricture is that contraction of the canal, which takes place in consequence of coagulable lymph being exuded between the fasciculi of muscular fibres, and upon the internal membrane, in different quantities according to circumstances."

Sir Charles Bell, in denying the muscularity of the urethra, has however recourse to the agency of the neighbouring muscles, in order to explain the nature of the obstruction which has taken place, and considers that the spasm is not in the stricture itself, but in the muscles surrounding it and the urethra.

Since the period at which these gentlemen wrote, a change has gradually taken place in the opinions of surgeons on these points, if not in their language; and although the words spasm and spasmodic are constantly used to express a particular state of parts, they are not intended in general to convey a distinct idea of muscular contraction, with which understanding the sense is immediately obvious, but without which it is as confused as it is indefinite.

The only case of pure spasmodic action, which has come under my observation, occurred in a gentleman, who has come to my house twice, in the course of several years, declaring he could not make his water, and desiring to have the catheter passed, which was each time done without the least difficulty. The first time he came he was quite aware of his situation; said it arose from anxiety of mind relating to family affairs, and that the passage of the instrument would immediately and effectually relieve him. If there was any obstacle, and I was by no means certain of there being any beyond a hesitation, it was at the commencement of the membranous part of the urethra, and arising, I suppose, from a spasmodic contraction of the compressor urethræ of Mr. Wilson, of which I have given a detailed description. As this gentleman suffered no kind of inconvenience at any other time, I am induced to believe, that there was no particular irritation in the urethra, and that it was, as the cause is unknown, what may be called accidentally spasmodic. I have read of a lawyer, a gentleman, but I do not recollect where I saw it, who often suffered in this way when engaged long in court in a difficult case, and who was always relieved in a similar manner; but here I should say it is more than probable the individual was labouring under some slight permanent irritation in the urethra, or that it was at least in an excitable state at some one part near the bulb. A healthy man, suffering from anxiety and alarm, often feels a desire to pass his water, which he cannot at all times restrain, and it flows whether he will or not; but if he has the power of restraining it for hours, then, indeed, the powerful contraction of the compressor urethræ may bring on irritation in the part, and spasm of the muscle; but this is the result of its own irregular and long-continued action, inducing inflammation and disease, and is of exceedingly rare occurrence; still it is not an instance of pure spasm, like the case I have related, in which the incapability was preceded by no uneasiness until the attempt at micturition was made.

The more common cases, which are usually considered spasmodic, are those of young men, who, when suffering from gleet or gonorrhœa imperfectly or only partially cured, are tempted to commit an excess in wine or punch. After sitting some time, they feel a desire to make water, which they repress, or perhaps indulge with some difficulty, but which increases, and is soon found to be irrelievable without assistance. The greater the effort, the more determined the straining, the greater the agony, and the sufferer, with despair depicted in his countenance, entreats relief. According to the received rules of surgery, the proper practice in such cases is, to relieve, first, the spasm by sending him to bed, by fomenting the parts with hot anodyne fluids, and by giving him a dose of the pulv. ipecacuanhæ comp., under the influence of which, in the course of a few hours of misery, it is not improbable but the urine may begin to flow. You then purge him with salts and senna, and it is likely that his urine may then flow in a full stream, when the evil subsides or entirely goes away. This is the practice you are generally called upon to subscribe to, but I always declare it to be bad, and never to be followed unless you cannot do any thing else. I was taught better many years ago by a Scotch friend of mine, a young man although an old soldier, who, after a debauch of this kind, which lasted half the night, found he could not make water when he awoke in the morning from his feverish dreams. He sent for me, begging I would bring a catheter with me. When I arrived, I proposed a warm bath, an opiate draught, enema, &c., his answer was peremptory enough,—"Damn your draughts, Doctor, pass the catheter, I have had it before." As remonstrance was useless, I passed the instrument with some little difficulty, and drew off his water, upon which he jumped into bed, saying,—"God bless you, Doctor, but damn your physic." In the afternoon when I saw him he was nearly free from inconvenience. Since that time I have always made it a rule to try and pass a catheter in every case of retention of urine. If it passes, so much the better; if it does not, the patient submits more cheerfully to the longer course of treatment. I presume I need not caution you against using force, which in such cases is unnecessary. It is by lightness of hand, and dexterity in the use of your instrument, that you gain your point. If you fail, inject a large quantity or repeated quantities of hot water into the rectum, and when the bowel is clear, and the hot water has acted as a bath to the neck of the bladder, inject into the rectum from 50 to 60 drops of laudanum in 2 ounces of warm water. This will remain, and by its sedative qualities often gives effectual relief. Leeches, bleeding, the warm bath, Dover's powder, or calomel, James's powder, and opium will assist; and by a repetition of these means, even in the worst of cases a relaxation or subsidence of irritation usually takes place, and the water begins to flow.

These are called cases of spasm, I call them cases of inflammation, and which induces a want of consent, as Sir C. Bell expresses it, between the muscles of the parts, so that when the bladder acts, the muscles surrounding the urethra will not act by yielding and dilating as they ought to do, but remain, or become more permanently contracted; the urine is forced against the inflamed and contracted part of the urethra, and by its irritation increases the mischief. When the water is drawn off the desire to pass it is removed, and the greatest irritation on the inflamed or irritable part of the urethra is thus taken away. Experience has also long pointed out to us, that when the patient can pass his water, the complaint is yielding, and the object is to get it to flow, and mechanical means in these cases will always do more than general ones, although I by no means deny their use as auxiliaries. If the case be more advanced, and the catheter will not pass, or you are at a distance from home and have not one small enough at hand, take a common bougie, and soften the point by dipping it into warm water, but which is not warm enough to melt the material of which it is composed, pass it down to the obstruction, and press it steadily, but not painfully so, against it, and let it remain for several minutes. It will often be found to pass on, or the patient will find on withdrawing it that he can pass his water in small quantities. The mischief here is a slight degree of inflammation, aggravated by cold or intemperance, but without any permanent alteration in the structure of the urethra, yet I do not believe it is caused by spasm. Let us be more precise. The difference between a spasmodic and a permanent stricture is this:—The *spasmodic* is supposed to depend on some muscular contraction of a temporary nature in, or exterior to, the canal itself. The *permanent* upon some positive alteration of structure of the wall of the canal, which thickens, and at the same time deprives it of its capability of being dilated with the same facility and to the same extent as in a state of health. This alteration of structure is produced by inflammation, although it is difficult to account for the various appearances which these altered parts assume from it alone. If the theory laid down by Mr. Hunter could be maintained, and the circular or the longitudinal muscular fibres described by Sir E. Home and M. Bauer could be satisfactorily demonstrated to be muscular, nothing could be more simple than the manner in which a stricture might be formed; and it is this simplicity which has won the belief of so many surgeons in that which they could not see, but which from its appearing so very satisfactory, they even wished to be the case. A temporary or spasmodic contraction of a muscular fibre is a very intelligible thing, and that after a time a continuation of this state should bring on inflammation and thickening is consistent with our general knowledge; and it is only to be regretted that it should not be an established fact, that a stricture is formed in this manner. A permanent stricture, which has offered during life considerable resistance to the passage of an instrument, may be found after death to have been formed by a mere line of irregular thickening, extending only for a third of an inch in an oblique direction along the canal. In most instances it is more or less circular, generally affecting the under rather than the upper part. The best case of this kind I ever saw was in a journeyman baker, who came to me many years ago with a stricture, not exactly at the orifice of the urethra, but at so short a distance from it, that it could be distinctly seen passing across the canal, like a thin fold of membrane. The opening for the passage of the urine was on the right side, and would not admit the end of a common probe, although a small one for the lachrymal duct could be passed into it. The temptation to divide this was irresistible; and after having dilated the opening a little, I cut through the septum, which resembled an opaque membrane drawn across the canal, with a blunt-pointed iris knife, and removed the disease, which appeared to be formed from the inner mucous membrane alone. The successful result of this case induced me to adopt a similar method of treatment in a stricture of the rectum about two inches from the verge of the anus, which occurred to me some time afterwards. The patient, a gentleman from Jamaica, came to me, able to pass only a urethra bougie No. 12, and which he had been doing, under the direction of his medical attendant, for some time, because a larger one could not be introduced. His situation was distressing, and demanding almost imperatively that some greater effort should be made for his relief. The very point of the fore-finger ascertained most distinctly, that the opening was in the middle of a septum, extending in every direction from the circumference, and I did not hesitate, after several examinations, to introduce a guarded and blunt-pointed bistoury through the opening, so that the blunt end just passed beyond it. I then turned the part of the edge near the blunt end, which was left unguarded, in four different directions in succession, and divided by each cut a small portion of the septum, when a bougie of twice the former size passed without difficulty. I was obliged to repeat this operation twice at proper intervals, when the largest-sized rectum bougie in common use passed easily, and the gentleman returned to Jamaica cured, although with the direction to use the bougie from time to time. These two cases, in addition to others less observable or marked, but nearly as conclusive, satisfied me that a mucous membrane was capable of producing a particular septum-like contraction in its proper canal, without the participation of its muscular or of its elastic coat; for I cannot believe that the muscular coat of the bowel formed a part of the stricture in one instance, more than the elastic coat of the urethra did in the other; and it certainly did not appear to be implicated in either. Repeated dissections have, however, proved to me, that in permanent stricture, the external or elastic coat is almost always more or less implicated; and that the degree of implication is usually in proportion to the obstinacy of the stricture. Thus, for example, a stricture two inches from the orifice will be the most obstinate and the most difficult of cure, in which the corpus spongiosum is found to be hard and unyielding to the touch. It is only to be exceeded in obstinacy of resistance and difficulty of cure, when this part is smaller and harder than natural, when it has, in fact, become impervious, or nearly so, to the blood by which in its erectile state it ought to be distended. A stricture of this kind, which is without the reach of any external muscular fibres, is said to be also spasmodically affected, and thus a permanent stricture is also said to be spasmodic as well as permanent. I do not however think that spasm, properly speaking, has any influence in such cases, and more particularly unless muscular or contractile fibres of the wall of the canal are admitted. A gentleman presents himself with a stricture at two, three, four, or more inches in the canal, which at the orifice is capable of admitting a No. 13 or 14 solid bougie, but the stricture will only allow a No. 6 to pass. You dilate this slowly, until a No. 10 or 11 will pass easily, when, anxious to have his case completed, your patient presses you to increase the size, and yielding to his solicitations, or tempted by your own desires, you pass over the intermediate number, and take the 13 or 14 at once; you will often be able to succeed, with little uneasiness at the moment, but your patient, on wanting to make water, finds he cannot do it: he strains, but it comes only by drops. The desire increases to misery, and he sends for you. Now, what would you do? Theory teaches, put him in the warm bath, give him an opiate, bleed him if necessary, for the case is one of inflammation; but practical surgery says, do nothing of the kind, but take a small elastic gum bougie without a stilet, and draw off the water. Your patient will be immediately relieved, will wish you good night, if he is a wise man, and go to sleep; when he wakes, he will make his water without your assistance; but if you try to pass a bougie for him some six or eight days afterwards, you will find yourself very much where you were when you began, that is, able to introduce only a No. 6. The part has contracted as much as ever, although perhaps it may be more readily dilated than it was before. The necessity for great gentleness in all these cases cannot be more forcibly exemplified.

An instance of this kind occurred to me this week, in a very particular case. The gentleman, a half-pay officer, had been a patient of mine some fifteen years ago, when I cured him of a fistula in ano, and of strictures of the urethra. When we parted, I recommended him to pass a bougie from time to time to prevent their return. This advice he neglected, and some two years ago, finding great difficulty in micturition, he applied to a practitioner of eminence in the Netherlands, who, after a long continued trial, passed a sound for ten inches, and said it was in the bladder; but as the symptoms did not diminish, he fixed a gum elastic catheter in the urethra, and kept one there, changing it occasionally, for fourteen months. The patient did not discover that the water did not pass through it, but came by the side of it for many months; and as the symptoms still continued unabated, the surgeon took to injecting warm water, and at last injected the rectum so full, that the patient discharged at once a pint or more per anum before his face. He now thought it time to give up the catheter, and some months afterwards came to London. It was quite clear, after due examination, that the catheter had passed behind the prostate, although the opening into the rectum had closed. The false passage began just anterior to the membranous part of the urethra, and the natural opening, or canal of the urethra, was so small, and the false passage so large, that every thing took that road, and it was only after a great many trials, and after great attention and management, that a small gum elastic catheter could be got into the bladder. After a few days, this was increased in size, and as he was an old performer, he got others made to suit himself, and went on to No. 14. I now advised him not to increase the size, as some urine came through some old fistulæ in perineo, but to pass a smaller silver catheter every other day. He suffered no uneasiness from his No. 14, and used to walk the streets and dine at his club with it in the bladder, and without thinking about it. I pointed him out in Piccadilly, to Dr. Fergusson, of Windsor, who happened to be in the carriage with me, and he would scarcely believe it. One Wednesday morning he left out his gum catheter, and on trying to pass a silver one on Thursday, he found to his great surprise the attempt to do so gave him excessive pain, and it would not proceed even for half an inch. He came to me directly, saying a horrible spasm had seized him. I tried a No. 8, and found it would not go half an inch without great pain, and a smaller one was perfectly stopped at three inches, by a spot which had heretofore shown little sign of disease.

In these cases there is really no spasm. The external elastic structure of the urethra is dilated, perhaps beyond what it can bear, and inflammation ensues. None however takes place, as long as the dilatation is continued; but as soon as the pressure caused by it is removed, inflammation ensues, the sensibility becomes greatly augmented, and the part contracts by its vital elasticity; by which I understand something like that property possessed by the middle coat of an artery, a property very observable during life, but which is lost after death. These cases may be called instances of spasm affecting permanent strictures; but where the urethra is really diseased, and the outer elastic structure is implicated, it is not absolutely necessary to have recourse to the idea of spasm of any muscular structure external to it, for an explication of the mischief.

That a muscular coat or wall of a canal can exert an especial and long-continued influence upon it, I have had opportunities of seeing; and in one case in the œsophagus, in a very remarkable manner. The patient, a young lady, had suffered for years from repeated difficulties in swallowing, which at last became positive obstructions, preventing the passage of either solids or fluids for days. The obstruction usually yielded almost suddenly, and the lady could then swallow liquids and small masses of food with tolerable ease. A good-sized œsophagus bougie could then be passed with little sense of opposition, although the stricture was distinct, when swallowing was impossible. It was situated about an inch below the situation of the cricoid cartilage, and no bougie could then be forced through it, although frequently attempted by several very able men. As the complaint continued, the impossibility of passing a particle of food became more frequent, and lasted for eighteen, twenty, and six and twenty days together, so that at last the lady became quite exhausted, and died from inanition, in the full possession of her senses, and with a Christian resignation of so perfect and admirable a nature, that it was impossible to look upon it but with the strongest feelings of gratitude to God for his goodness. On examination I found the œsophagus externally of its natural appearance, without the slightest sign of constriction. When slit open, it appeared of its usual thickness, and without any deviation from its ordinary state with respect to the appearance of the muscular layers; but on the inside, and adhering firmly to the mucous coat, there was a false membrane, the upper edge of which appeared to have been separated, in consequence of the repeated application of the bougie, and a little turned inwards, so as to fill up, in part, the canal, through which however any common-sized bougie could after death be passed. The mucous membrane from this part onward to the stomach, which was not allowed to be examined, seemed to have lost its normal character, and to have taken on that of a serous one on which a false membrane readily forms, but which rarely occurs on a mucous one, unless some great alteration has previously taken place in it. The difficulty which existed at all times, for several months, arose from this false membrane, which could be peeled off, and resembled chamois leather; whilst the permanent and insurmountable obstacle, which often occurred for three weeks at a time, must have arisen in part, I conceive, from muscular contraction, although no trace of permanent stricture was observable after death.

I am led to infer from a due consideration of these and many other similar cases, that the canal of the urethra may be perfectly closed for a considerable length of time by a spasmodic contraction of its muscular coat of a transitory kind, provided such muscular coat were believed to exist; but as such belief is not commonly entertained, I prefer supposing that the obstruction takes place from inflammation of the internal mucous membrane, which alters its attractions and properties, assisted by an undue contraction of the elastic and outer wall of the canal, dependent on its vital elasticity or contractibility. I believe this to be the case in all instances except those alluded to in the commencement of these observations, in which an undue action of the compressor urethræ muscle alone may have produced the effect.

When the outer elastic wall is only excited to contract, but is not thickened, the case is then one of those usually called a spasmodic or dilatable stricture; when the elastic coat is altered in structure, it is then called a permanent stricture; and these may be divided into two or more kinds,—those which are completely curable, and those which are not; so that in whatever manner the latter are temporarily removed, they are prone to return, and will return without care is taken to prevent it.

The slightest perceivable alteration is a mere thickening or condensation of the elastic coat, and constitutes the first step or stage between the dilatable stricture or the curable permanent, and the incurable one; the extent, great obstinacy, or narrowness of obstruction being no proof, although it may be a presumption of the more incurable nature of the disease; inasmuch as some of the most permanent cures I have effected, and which have stood the test of years, have been made where the obstruction was great, and the obstacle nearly impassable by the smallest instrument.

It has been said, that strictures are formed by excrescences, caruncles, or tubercles, growing from the wall of the urethra. I have not seen, after death, any thing of the kind, or any irregularity of this nature, beyond small projecting points on spots which appeared to be caused by the common inflammatory process. I by no means, however, intend to deny the possibility of such growths, because I have felt, on several occasions, a sort of soft obstruction, which always bled freely until removed, and which might have arisen from excrescences of this nature; and more particularly, because I have seen two cases, in each of which an excrescence grew from the side of the urethra, about half an inch from the orifice. In both cases they resembled four or five granulations, adhering to and growing from each other. They were cured with some difficulty by pinching them with forceps, and applying caustic to the part from whence they grew. These cases would lead to the belief, for I know no reason to the contrary, that a similar disease may take place in other parts of the canal where it cannot be seen.

The urethra may be generally, although slightly, thickened for a certain extent, and the surface of the internal membrane changed in its appearance and altered in its function, without any positive obstruction to the passage of urine ever taking place, and without much prospect of a perfect cure being ever effected. A gentleman came under my care, sixteen years ago, with stricture five inches from the orifice of the urethra, through which a solid silver bougie could not be passed, although a similar sized soft one could, and this peculiarity remained until his death, which took place last year. Whenever the canal contracted a little a solid bougie would not pass; whenever it was dilated, so as to admit a No. 10, it would then pass, although not so easily. This gentleman died of apoplexy, having been in the habit of passing a bougie twice a month or oftener, and of showing himself to me every year, or two years, and I had the opportunity of examining the urethra. For the extent of an inch the canal was altered in colour and appearance, being yellower and rougher than the remaining part, and the wall was a little thickened generally, but there was no particular thickening at any one part; so that the disease, in all probability, arose from inflammation attacking the urethra for the extent of an inch, and giving rise to a similar alteration for the same distance. The sensation communicated on passing a bougie was that of its going over a rough hardened surface for some extent, and the dissection proved the fact. The difficulty in introducing a solid sound arose from the length of the inelastic part, and from its being beyond five inches, and more firmly attached at and below the pubes at that part.

In the generality of stricture cases, the state of parts is exactly the reverse, and the obstruction which may have even proved fatal, does not exceed an eighth of an inch in thickness. When it is of greater extent, it is usually believed that two or more distant points of inflammation have each given rise to contraction, and by frequent recurrences have implicated the intermediate parts, so as to cause an affection of the whole; and at last, under repeated attacks of irritation, a large hard cartilaginous mass of disease is formed, not only of the urethra but of the surrounding parts; in which state it is almost incurable even by the knife.

The canal in front of a stricture does not seem to be affected by it, as far as regards its permeability or elasticity. It remains in its natural state, unless affected by inflammation, although the actual surface or anterior part of the stricture itself is often extremely irritable, bleeding as well as being very painful on the slightest touch. The part posterior to the stricture is usually supposed to be dilated, and the practice of opening the urethra at that part is founded on the supposition, which practice cannot always be correct, because the supposition is not always well founded. When the obstruction has been great and of long standing, the urethra behind the stricture is often found very much dilated, but it is not always so; and this dilatation may take place in every part of the canal. It more frequently occurs, or at all events is more often observable, when the obstruction is a single one, and in the pendulous portion of the urethra. In order to give rise to it, the obstruction must have been considerable, and the coats of the bladder must have gained in thickness and in power, in proportion as the contractile property of the urethra has been diminished. The bladder, under constant action and straining, thickens, diminishes in size, becomes irritable and impatient of its contents; whilst the urethra is dilated, and immediately behind the stricture becomes more irritable than before it. Little is wanting, in such cases, to give rise to complete retention of urine, ulceration at the irritable spot, the effusion of urine into the surrounding parts, and the death of the patient, unless the *science* as well as the *art* of surgery are brought to his relief.

LECTURE VIII.

The symptoms of stricture, like those of most other diseases not immediately affecting life, are often as slow in their progress, and as insidious in their nature, as they are appalling in their results. They may be divided into several stages, both with reference to the age of the patient, and to the nature and duration of the complant. When a young man has suffered from a long-continued gleet, in the manner I have already described, he is in all probability first alarmed by a partial retention of urine; from having been obliged to make his water on the first sense of desire taking place, and which he could not restrain for an instant, he finds he cannot now pass it except by drops, or with great straining, or perhaps not at all. This usually occurs after a debauch, and is generally relieved by the warm bath, or hot fomentations to the perineum, and a gentle dose of medicine, and the patient is equally aware of the cause and of the means of relief. This is the first inflammatory stage attended by thickening only of the mucous membrane, and admits of the urine being sometimes evacuated in what is called a full stream. On this point however persons are always deceived; they never duly estimate the size of the stream they formerly made or now make, and when they are cured they always express their surprise at the difference which has taken place, and their astonishment that they should not have perceived the alteration. It is only when a great change has occurred that the sufferers are aware of the fact. The discharge, which it is probable may be but trifling, glues the sides of the orifice of the urethra together, and the urine which passes first in the morning often comes from this cause in a double or forked stream, whilst at others it is quite natural. The desire to make it is more frequent, and the patient has to get up at night sometimes four or more times, instead of sleeping the usual number of hours quite soundly; although its evacuation is rarely accompanied by pain, unless the prostatic part of the urethra, or the neck of the bladder, are particularly affected. The more anomalous sensations differ much from each other. Some persons feel only generally debilitated, others suffer from flying pains in the hip, a sort of weight in the pelvis, with uneasiness in the perineum, and there is a very marked symptom which frequently prevails in more permanent and irritable strictures, *viz.* a pain extending from the perineum down the inside of the left thigh, and which occurs very rarely in the right, although I know not why it should be so. When the derangement has become a permanent stricture, the patient is much less liable to a sudden attack of dysury, or retention of urine, than he was in the mere inflammatory stage, but the stream of water has become less, and he is sensible of the more frequent desire to pass it, and that it is longer in flowing, although a smaller quantity is made at a time. He is also aware that he can repeat the attempt in a less space of time than formerly; for unless the bladder has become more than ordinarily irritable, the whole of its contents are not discharged, but only such quantity as relieves the urgency of desire. There is still a discharge, and it is often this that makes the sufferer apply for advice, rather than the other symptoms. When the disease is more advanced, the urine flows only in a very small stream, either twisted, forked, double, broken, or passing by drops, and the patient is even obliged to solicit and assist its passage by pressing with his finger in the perineum, and at the same time elongating the canal, something in the way, as a gentleman once said to me, a dairy woman milks a cow. When the disease has reached this point, the urethra may have become dilated behind the stricture, and some water remains in the dilated part after the bladder has ceased to act, and this dribbles through the stricture, keeping the patient wet and uncomfortable, and often excoriated. This symptom is experienced in a less degree at a much earlier period, and the younger patient often complains of the longer time he is obliged to occupy than formerly in getting rid of the last drops of water. This inconvenience sometimes remains when a man is apparently cured, and can pass a full-sized bougie with only a slight sensation when it goes over the part affected. This some patients expressively enough call *back water*, and it occurs either from there being a small bank of stricture remaining, or from that particular part, in which it was situated, having its natural elasticity impaired, or from the dilated part behind not having resumed its natural dimensions. It is therefore the last symptom to be removed, and it is never effectually done unless every vestige of disease has disappeared. The straining, which is necessary to expel the urine through a very narrow opening, brings into action the abdominal muscles, and this often gives rise to a rupture, by which the maladies of the unfortunate patient are augmented, and he is obliged to encumber himself with a truss. His miseries are only, however, now beginning; the excessive actions of the abdominal muscles lead to a corresponding relaxation of the sphincter ani, and the fæces pass in small quantities involuntarily during the effort; the mucous membrane of the bowel protrudes, and this protrusion sooner or later, combined with bleeding piles, augments his distresses, which are even increased from time to time by an irritation of the whole of the mucous membrane of the bowel, which sympathizes with the urethra, and occasionally causes a diarrhœa, that augments all his evils to a point almost unbearable, and is often removed as by a charm, by any thing which will allay the irritability of the stricture. Hitherto we have attended to one function only of the urethra; its second and hardly less important one in middle life, shares alike in and adds to its difficulties. In the early stages the irritation of the prostatic part of the urethra and of the neck of the bladder, with which in structure and function it is inseparably connected, leads to the increased desire to make water, and the establishment of chronic inflammation; these re-acon the diseased part of the urethra in front, and materially augment the mischief. The orifices of the prostatic ducts inflame and enlarge, and the inflammation extends to the glandular structure itself, even if it has not been sympathetically affected previously; the emission of semen is attended by excruciating pain, and a dull heavy weight referred from the perineum to the part, with an especial tenderness in the rectum when the prostate is touched, mark the progress of the evil. The irritable state of the habit is immediately augmented, a cold shivering occurs followed by heat; these are repeated and fever is fairly established, the secretion of the liver is principally deranged, and vitiated bile is discharged in great quantities; the fever at last gradually diminishes, although it does not entirely subside, and assumes more of an intermittent type, but not before a greatly augmented discharge of matter from the urethra marks the opening of an abscess of the prostate into it, or a tumour in the rectum or perineum indicates its probable evacuation in these directions, and which must if necessary be assisted by art. The cup of misery is not yet full. The bladder partaking of disease may either be very much thickened and diminished in size, as well as acutely or chronically inflamed, or it may be augmented in size without being materially thickened. When the disease in the urethra has been rapid in its progress and acute in its symptoms, the bladder more often partakes of the first state; when the disease causing it has been slow in its progress, and situated at the neck of the bladder itself, or in the prostatic part of the urethra, it has appeared to me to be more often of the second. In either case the desire to make water is continual, the irritable state of the neck of the bladder and of the part immediately adjacent allow scarcely a moment of rest, and if pouches have formed in it, every turn of the restless individual renders his desires more urgent, by emptying these pouches of their contents. Worn down by his sufferings, in the agony of despair he prays to God for his dissolution; and if it has pleased the Almighty to weaken his intellectual faculties, as it has been his will to afflict his bodily powers, he sometimes becomes forgetful of his duties, and seeks in laudanum or other narcotics for a temporary solace, which he hopes and expects may put an end to his miseries.

The testes at an early period of prostate irritation often partake of disease. This has often been supposed to depend on sympathy, but I apprehend, and am inclined to believe with Mr. Abernethy, that it occurs from the continuous propagation of irritation from the opening of the ejaculatory ducts into this part of the urethra. The testes become uneasy, then painful, and a little swelled. In warm climates the irritation usually terminates in hydrocele, with a softened and enlarged, or sometimes a hardened and enlarged testis. In more northern climates, abscess occasionally takes place, or chronic induration is sometimes mistaken for scirrhus. Some of the most brilliant cures I have been the means of effecting in surgery, have been made in cases of this nature.

When the obstruction to the passage of urine is nearly complete, the violent efforts made to discharge it bring on ulceration, and some parts yield. The bladder has been said to burst, but this is of very rare occurrence indeed. I have known the bladder ruptured by a fall from a height when a quantity of urine was contained in it, but not solely from its own action, or from over-distension. Mr. Brodie has alluded in his work to two cases, which occurred in St. George's Hospital, of this kind; but these, or others of a similar nature, are only rare exceptions to a general rule, that the urethra yields before the bladder; when the urine is effused into the surrounding parts, giving a temporary relief, to be followed by more fatal symptoms, unless the science as well as the art of surgery are brought to the assistance of the sufferer. The surgeon may at this moment prove a guardian angel, one single thrust of a lancet in the proper direction may suffice, and the unhappy man, groaning in the utmost agony, is at once relieved, and placed in comparative safety; whilst in a few minutes more the rupture of the urethra, and the extravasation of the urine place him in a situation from which he will never probably be extricated, or only after much suffering. The urine is forced into the cellular membrane with all the power of the bladder acting spasmodically: the instant the rupture of the urethra takes place, the patient is relieved by the extravasation; he is sensible that his urine is flowing from his bladder, he hopes he is passing it, as the accident usually takes place in a moment of great straining and agony, but on looking down, he perceives with alarm the scrotum and the neighbouring parts greatly distended. He is however for the time relieved, the extraordinary excitement of the bladder ceases; and as the pressure and irritation on the posterior part of the stricture are partly taken off, the urine even dribbles through it, exciting hopes which are not likely to be realized. The white doughy feel of the scrotum assures the surgeon of the danger of his patient; he hopes yet by several free incisions to save him; but if he is not called until the skin of the scrotum, of the penis, or of the lower part of the abdomen, has taken on an erysipelatous blush, he will be, in all human probability, too late. The cellular membrane has lost its life, and must slough away with its covering skin, under which, and indeed before this process is completed, he sinks and dies. Mortification in these cases often rapidly supervenes, black patches appear in different places, the febrile symptoms are momentarily augmented only to be depressed, and the same symptoms of anxiety and distress, which supervene in all other cases of mortification, attend on this. The cessation of pain, the extreme exhaustion, the inexpressible anxiety of countenance, combined with clearness of intellect, mark in the most fatal manner the nature of the case; and the patient's expression of his sanguine hope of recovery is only interrupted by the dim shadows of approaching death, which cast a blueness and a film on surrounding objects, which he himself observes and complains of, and but too ineffectually attempts to remove; or if his powers have been more slowly exhausted, he gradually sinks into a state of coma, or low muttering delirium, and dies.

This rapidity in death is not always so great; the ulceration of the urethra may be slower in its progress, an abscess forms external to it or to the bladder, the contents are then discharged, either naturally or artificially, and a passage through is thus established for the urine, and several fistulæ in perinæo or above the pubes or in the groin are or may be the result. This also, in middle aged or elderly persons, or those of bad constitutions, is often attended with great danger; a high degree of fever supervenes; cold shiverings mark the formation of matter, the pulse becomes as quick as it is small and irritable; the tongue gradually assumes a brownish colour, and is dry to the appearance as well as touch; the countenance changes to a dingy yellow, a reddish spot forms on the cheek, and if the abscess is not early opened, and relief in this way obtained, the patient equally, although less rapidly, sinks and dies. Its contents are always dark coloured, and unhealthy and fœtid, indicating the urinous participation in its contents.

In some few cases, but which I hope may always in future be obviated, the stricture is never so very complete but that some urine can find its way through it, and, by the great effort and urgent solicitations of the patient, it passes in a small, wiry, spiral, and often unconnected stream; it comes more often by drops, or rather it dribbles away, forcing the patient, in better circumstances, to wear a bag to receive it; whilst the poor man, on whose clothes it falls, is rendered an object of abhorrence to himself as well as to all around him. It is with regret I recal to my recollection the situation of an officer, a captain of the navy, whose urethra I opened too late, some years ago, to bring the desired relief; and who, by the present improved modes of treatment, would, I am persuaded, have been saved. His bladder was enlarged, as it usually is in these cases, and was never completely emptied, although the urine constantly dribbled away. Affected by chronic inflammation of its mucous membrane, the urine was and is always, in these cases, loaded by a viscid muco-purulent deposit; and which, from its long retention, has often partly undergone that decomposition, which renders it offensive in more than an ordinary degree.

When the irritation is entirely chronic, the thick white viscid secretion predominates; when it is more or less acute, the muco-purulent. When chronic from time, but acute from suffering, the quantity of this kind of matter discharged is quite surprising. In these cases, and in all others of a similar nature, the mischief is not confined to the bladder if the disease continues for any length of time. The ureters and kidneys become affected, and the destruction of the latter takes place in a variety of ways. It is usually supposed that these alterations of function as well as of structure, begin not from the kidney sympathizing with the bladder and urethra, in the same manner as the testes have been presumed to be affected, but by the extension of inflammation from the lining membrane of the bladder to that of the ureters. Without denying that this may be the case in some instances, I am not disposed to believe that it is the most frequent or common cause of such disease taking place in all. In the generality of them, the disease of the kidney is accompanied by more or less of dilatation of the ureter; and, from the views I have entertained of the manner in which the urine is admitted into the bladder, I suspect that it is the dilating and dilated state of the ureter which gives rise to the mischief in the kidney. In other words, the accruing difficulty to the ingress of urine into the bladder, whilst the kidney continues to secrete it, causes distension of the ureter, pressure on the tubular as well as the secreting parts of that organ, and ultimately chronic or acute inflammation, ending in absorption of its substance, dilatation, abscess, or other lesions of structure usually found in these cases.

If an abscess, under any of these circumstances, should lead to a communication between the urethra and rectum, the misfortunes of the individual are complete. The future offers to him but little prospect of health, of comfort, or of happiness; for although I have known some instances of a cure being effected under these deplorable circumstances, the generality of sufferers have had, for the remainder of their lives, to bemoan their miserable existence, and to pray for its speedy termination.

On the method of examining the Urethra.

When it becomes necessary to examine the urethra by the bougie, in order to ascertain the nature of the disease existing in it, the surgeon should regulate his proceedings by the age and the symptoms of the patient. If he is a young man, suffering but little, and making his water in a tolerable stream, a solid silver sound is the best instrument; because it will always pass with much less pain or inconvenience to the patient, and is less likely to be interrupted in its progress by any of what are called natural obstacles. It should be well oiled, smaller at the point than in the shaft, and of a size to pass very readily into the orifice, whatever the size of it may be; it is to be, in fact, not more than two-thirds of the size of the canal. If the urethra is sound, this will meet with no obstacle, give no pain, and only cause a feeling of desire to make water as it passes through the prostatic part of the passage, accompanied by a sense of faintness, if it has been passed for the first time, but which does not always occur, and will not recur after two or three trials. If it gives rise to soreness or pain, as it passes on, or rather over the part particularly affected, although its progress is continued without inconvenience, it shows by this the portion of the urethra which is suffering from chronic inflammation. If the sound stops at the spot, instead of passing over it, and only proceeds after a little pressure, it indicates a thickening of the mucous membrane, and a probable loss of elasticity of its external covering, constituting what is called a dilatable stricture. It is not often that a derangement of this kind is found after the first six inches and a half, and when none is discovered in this space, the complaint is in all probability in the prostatic part, or from seven to eight inches, or even nine, as the case may be. If the instrument passes without obstruction, but with a pain which is often so very severe as to make the patient exclaim not only of it, but of the desire to make water, the disease is in the membranous part, and may extend by continuity of structure to the neck of the bladder; which will be shown by its irritable state, and the urgency of the calls to rise at night to evacuate its contents. If the sound is arrested at or about seven inches, and after some difficulty, and on withdrawing it and depressing the handle, it then passes over an obstacle into the bladder, the complaint is in all probability an inflammatory swelling of the transverse portion of the prostate; and must be treated very gently and cautiously, by abstaining from the use of instruments, or by using them very rarely, and at long intervals. In the former case of prostatic membranous inflammation, the solid sound should be laid aside, and the cure completed by the small soft bougie, which is to be carefully and very gradually increased to the full size of the orifice. When the obstacle to the passage of the instrument exists at the very entrance into the bladder, which is known first by the resistance at from seven and a half to eight or even nine inches in different persons, and by the peculiar sensation communicated by it to the hand as it enters the hollow bladder, the elasticity of the neck of this organ is impaired, but not irrecoverably so. The patient will in this case not only have a frequent desire to pass his urine, but will find it very difficult to do it; and even when a No. 12 can be passed, he will sometimes be unable to evacuate his bladder but by drops, and at last not at all. With a narrow stricture the young man makes a stream, however forked, spiral, or small. In this complaint he can scarcely make it at all; and at last cannot do so, and must be relieved by the catheter. I have never seen this disease in a person under twenty-six years of age, and it is more common between thirty-five and forty-five; although, when once formed, it will continue through life, unless relieved.

When a young man has a permanent stricture, the sound if small enough passes through it, giving to the hand of the surgeon the sensation of going over a ridge; and it is quite curious to observe how small an increase in the size of the instrument will often prevent its progress under any reasonable pressure. After a little time the obstruction becomes greater, and the opening narrower, so that the instrument which passed on the first trial will not go through after the violence offered by the larger one. The face of the permanent stricture will in fact not yield; yet if a smaller-pointed conical instrument be insinuated into it, it will then give way by its inner circumference, but not by its surface; and a larger instrument will then go through without doing much mischief, if it does no good. If the bougie hesitates but afterwards passes, on extending the pendulous portion of the urethra and thus putting it on the stretch, it has in all probability hitched on a fold; and if a small-pointed instrument is used, and is arrested at a particular spot, whilst a larger and rounder-pointed one passes over it, the obstacle is most likely caused by an enlarged orifice of a follicle, and which may bleed freely, if the pressure of the small bougie be continued. If the larger bougie passes over a spot which is exquisitely painful, and which bleeds, it will often lead to the suspicion of an ulcer; and if much blood flows without any obstruction, or there is only a sort of hesitation, a soft fungous growth may have taken place from it, such as I have already described.

When a moderate-sized bougie will not pass, and the diminished stream of urine leaves no doubt of the existence of a narrow stricture, a smaller bougie must be had recourse to; and if the obstacle is evidently before the curve of the urethra, or five inches and a half, the instrument, whether solid or soft, should be straight and must be used with a light and gentle hand; by which means, and after several trials with the point turned in different directions, it may perhaps meet with the opening of the stricture, and pass through. Too much, however, should not be done at one essay. Pressure on the face of a stricture with any kind of bougie, I have already said, does more harm than the passage through it of a larger one. In these cases it will be necessary to take an impression of the face of the stricture, in order to discover where the opening is situated, by which means the point of the instrument may be more certainly directed to it. This is accomplished by means of a middle-sized bougie, the point of which is first softened by dipping it into hot water, or by a model bougie, the point of which is made of softer materials than the shaft. This should then be well oiled, and passed down to the stricture, against the face of which it is to be gently but steadily pressed. If the stricture, although narrow, is not very tough or permanent, it will sometimes yield, and the softer bougie goes through, when the point of the harder one only bends, twists, or turns back, the bougie having doubled on itself in the passage. If the stricture does not yield, the soft bougie does, and is gradually pressed into the sinuosities or openings on its surface; so that after remaining some minutes, it is withdrawn with one or more processes projecting from the end of it, either acute or obtuse as the case may be, and indicating the commencement of the true, and sometimes also that of one or more false passages. The experience of the surgeon will now be his best guide; he will remember that this obstacle is much more often below than above, and that a channel in that direction is much more often a false than a true one. Messieurs Ducamp, Lallemand, and Phillips, recommend for this purpose a model bougie, the end of which is particularly soft, by being made of a quantity of cotton threads drawn through an elastic tube hollow at each end. The cotton threads, when they are nearly drawn through, and only a small portion projects, are to be dipped into a composition composed of equal parts of bees' wax, empl. plumbi or diachylon, and cobbler's wax, and are to be rolled in the usual way, until the bougie appears smooth, round, and of an equal size. The French make this soft part too long; and they are therefore objectionable as imported from Paris, inasmuch as they bend more than is necessary, and leave a portion of the composition behind and in the stricture, giving rise, as Lallemand has himself shown, to great inconvenience and even distress. This is in some degree avoided, by making the cotton thicker, and the soft point altogether shorter*. The desired information being gained, and the size of the opening ascertained, its passage is to be attempted by some duly-selected instrument, of a firmer material, of plaster, of catgut, or caoutchouc, which last will be without comparison the best, if the obstruction be situated at or near the curve. It is not however an easy matter to hit the small opening; and many efforts may be made in vain, until at last one better directed or more fortunate succeeds. If by a bougie, it should be allowed to remain in for an hour; and if a catheter, it should be kept in altogether, unless the bladder is peculiarly irritable; and then it need not be carried into it, but be firmly fixed an inch beyond the stricture. This method is not however necessary, and is often so inconvenient to the patient's pursuits that it cannot be adopted. A solid sound or catheter can only be used straight, or with its accustomed curve; a gum-elastic one can be made to take any curve; and a soft bougie may be so managed by bending it a little about an inch from its point, to the right or the left, or otherwise, that the shaft may be level with the under part of the canal, whilst the point is directed against the upper.

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* Mr. Ewen, of 106, Jermyn Street, has lately made some model bougies which are less liable to objection than any I have seen, and appear to me to answer well.

When an elderly person is to be examined, who is known to have had stricture from his youth, there is no difference in the mode of proceeding; save that any stoppage of a small-sized instrument, although it has gone beyond six inches and a half, must be viewed with great suspicion, as indicating the possibility of chronic enlargement of the prostate, which part should then be examined per rectum, and its enlargement, if any, ascertained. If this should be the case and the stricture admits of it, a large catheter will be found to pass easily, when properly borne against the upper part of the urethra, and its handle duly depressed, when the curve or stoppage of the smaller one will be satisfactorily explained. When the obstacle is further on, and at the neck of the bladder, it will be easily felt with due examination, and will be equally well known by the sudden flow of urine on its entering the bladder, and by the peculiar sensation communicated to the hand at the moment.

If the elderly or middle-aged man has attended but little to himself, and only knows that he has been some time suffering with a derangement about these parts, but what he cannot tell, and has no knowledge of any disease in earlier life, the surgeon must be cautious, even in his examination with a solid catheter, which is yet preferable to a soft bougie. There is, in most cases of disease of the prostate, some sympathetic irritation at the membranous part of the urethra, which will often offer considerable resistance to the passage of an instrument of a large size, and lead to the suspicion of stricture, after the same manner as irritation there in early life gives rise to a dilatable one. If a large catheter be forcibly used, the urethra will resist; but, unless there really be a stricture of a permanent kind, this irritable spot will be readily passed by gentleness and judgment in the management of the instrument, when the true nature of the complaint will be easily discovered. If there should be a permanent stricture, which is either unknown to or only suspected by the patient, the steady and regular obstruction to an instrument of a certain moderate size, whilst one a little less will readily pass through with the usual sensation of riding over an obstacle, will demonstrate its nature. Strictures in the urethra are prone to give rise to disease about the prostate, if not of the gland itself; but still, persons having the true chronic enlargement of the prostate are not as commonly affected by obstruction in the anterior part of the urethra as might be, *à priori,* supposed.

The disease being ascertained to be stricture, the means of cure are to be selected. They are four in number—by dilatation, by caustic, by division, and by a combination of all these methods, as the particular circumstances of the case may at different times require.

On the Cure of Stricture by Dilatation.

As an impassable stricture cannot be cured by dilatation until such time as a passage is obtained through it sufficient to admit a small bougie, I shall for the present suppose that passage to exist. A bougie of a size that will pass without inconvenience, is to be introduced and allowed to remain for an hour, and if the bougie is a little conical, the stricture may not only be completely filled by it but moderately dilated. If the stricture be very irritable the soft bougie may be grasped and marked by it, and the same thing will occur if the bougie be too large and too strongly forced into it. If the bougie be rather too large at the point it will not proceed on meeting with the stricture, although sometimes by a gentle pressure for two or three minutes, the stricture will gradually yield and allow it to go through; but there is a probability that more irritation will follow this mode of proceeding than if a small one is first introduced for a quarter of an hour, and a larger one then made to take its place, which it will almost always readily do. This is in fact the principle on which dilatation should be conducted, and it will always be accomplished more safely and easily for the patient if done in that manner; for a larger bougie can always be introduced if it follows a small one, than can be got into the bladder without such a precursor. This is a fact that does not admit of a dispute. I never use the bougie as a mere dilating instrument oftener than every two days, and when the urethra is irritable only every three and sometimes four days. Proceeding in this manner the stricture gradually yields, and a bougie, whether made of plaster or of silver, and as large as the orifice will permit to enter, will at last proceed through the whole passage without meeting with any obstacle; and it ought to be repeated at longer intervals until this disposition for contraction seems to be removed. Where a stricture has been a permanent one, the patient should be taught the manner of doing it, so that he may use it once a week, then once a fortnight, and at last once a month, or quarter. In this manner I have made some most successful cures, even where the patient at the beginning of the treatment could scarcely pass his water; and there can be no doubt of its being the best when it is successful, as the inner membrane of the urethra is by it restored as nearly as possible to its former and natural state, and without any new formations; for, although the question of the reproduction of mucous membrane has been much agitated, and particularly by continental writers, there does not seem to be any sufficient reason for believing that a reproduced part is so perfectly like the original structure as to resemble it in every respeot, and particularly in its secreting properties.

It happens, however, most unfortunately, and in too many instances, that the orifice of the urethra will not admit an instrument of a size sufficient to dilate the constricted part to the natural dimensions of the canal; and more unfortunately still, that if the orifice be dilated by division downwards, so as to admit a sound as large as the urethra will bear, still the diseased part cannot always be sufficiently dilated to remove its contracting properties, and the patient from neglect or otherwise, finds it impossible to keep it up; in other words, the disease is not cured, but only kept at bay, ready to return in a few weeks, or months at most, and to be quite as distressing as before. This method of proceeding will, however, cure a great number of persons who cannot be cured by the simple passing of the bougie without the division of the orifice; nevertheless, it will not cure all, and many persons do not like the operation. It was formerly done, as I have already said, by stretching the orifice until it yielded, when it was torn generally downwards. This was fashionable then, but it is not so now; and if you are obliged to do it, or think it right to do it where the orifice is naturally very small or contracted, you should do it with a small sharp knife; and if a short bougie of a full size be introduced every morning for a few days, the orifice will remain patulous for the future. This practice succeeds, because the sides of the orifice possess their natural peculiar structure, and the inferior elastic part is quite cut through; but it does not succeed in a similar manner when the whole orifice has been eaten away by ulceration; it then contracts in healing almost to the smallest possible point, constituting a stricture at this part, and giving rise to very serious reflections, which bear very forcibly on the different modes of treatment. As far as I know from personal observation, or from written testimony, this sort of stricture is never cured by dilatation, although it may be relieved; and where a person has such a complaint, he should always carry about with him a short silver tube, to be introduced for an inch occasionally or whenever he wishes to make water, in the same way I am told the eunuchs, called black, from the extent of mutilation, do in the East. I have never seen although I have read of a case of this kind having been cured by caustic, but I suspect it was only a temporary relief, followed by greater contraction; and the best means I am acquainted with is to divide the orifice downwards, and prevent the wound contracting and closing during cicatrization by the use of the bougie.

If you divide the orifice in this manner, and by this means are enabled to dilate the urethra to a greater extent, it still does not always succeed in effecting a permanent cure; for although the solid silver sound will go through the orifice, it will not proceed along the urethra without giving more pain than many people will submit to, and is therefore abandoned, the patient either changing his surgeon, or determining on putting up with the inconvenience. If this evil does not occur, another may; *viz.* the urethra becomes generally irritable or inflamed, an acute discharge is set up, and the bougie cannot be borne at all: or if this does not occur, it soon becomes apparent that this augmented dilatation is not sufficient to effect a permanent cure, and that a greater dilatation cannot be borne generally by the urethra. Under these circumstances, attempts have been made to dilate the diseased part without dilating the whole, and even by this proceeding to avoid the preliminary step of dividing the orifice to obtain room for the admission of the larger instrument. My first attempt in this way was by having a bulb made about an inch from the end of the instrument, which was small at its point, and gradually increased into a bulb, from which it again diminished to a proper-sized shaft. This gave very much less pain than an instrument of the same size throughout, but I was soon satisfied that it was insufficient for all cases, and that in some a greater dilatation was necessary in order to effect a permanent cure, than could be made by this method. I then had an instrument made with a bulb which opened by a piece of mechanism within it, worked by a screw in the handle, and I thought I must now certainly succeed; but this rather did too much, by producing irritation on the stricture and affecting the neighbouring parts, as the bladder, and even the testes, and proving to me that dilatation would not cure every kind of stricture. The history of the instrument is curious, inasmuch as it is the parent of most of those which have been made for various purposes connected with the bladder and urethra, and of many of the various improvements in the treatment of stone in the bladder which have been since introduced.

LECTURE IX.

In order to have a dilating and dilatable bulb, I applied to Mr. Weiss, who did not at first see how it was to be done; but on my mentioning that I wanted something which could be enlarged like Ruspini's ball forceps, the application of the proper mechanism struck him at once, and he soon made me some instruments, which, although rude on the first essay (and these I have by me), soon became more efficient and polished in their appearance. They were composed of three blades, gradually separating by the action of a screw which turned in the handle. This same mechanism he soon after applied to a two-bladed instrument, and thus the forceps for removing a stone from the bladder made their appearance, and were first used with great effect, and were brought into notice by Sir Astley Cooper. I thought I had now obtained an instrument which could not fail of fulfilling all my expectations, and was only disappointed by finding it did too much. The opportunity of dilating was too tempting to be resisted, and the consequence was, that it produced irritation in so many cases, and did so much mischief, that I was forced to give it up, and I only now use it in some protracted cases in which I wish to dilate the neck of the bladder, and that not even of late, for the force with which the instrument acts cannot be readily estimated. When these blades act by a screw which turns in the handle at six or seven inches distance, they dilate, or are readily separated when there is no opposing force; but when there is any opposition, their separation is easily prevented, and the screw is turned more than would otherwise appear necessary before any effect is produced. If it is not turned sufficiently nothing is done; and if it is turned a little too much, mischief is the consequence, and it very easily ensues; so that, although I might wish occasionally to use it, I soon found that I must give it up from prudential, or rather selfish pecuniary motives.

At this same time I had under my care a little boy, who lived in St. Martin's Court, with a stone in his urethra, apparently too large to find its way along the passage to the orifice; and Mr. Weiss made for me another instrument of a different kind, which I now show you, for the purpose of catching and pulling it through. It is a model in miniature, or nearly so, of the percussor now used for breaking up a stone in the bladder; and with the adoption of the screw in the handle, and the teeth in the grasping part, it is nearly a model of the latest invention for crushing a stone in the bladder, without the alarm which the preparation by position, &c., and the shock of the blow give rise to.

Foiled in having a steel dilating instrument, I was much pleased with the idea of one made of softer materials, proposed to me by Dr. Arnott, which was to be dilated by air or water. When he first showed it to me, it was merely a piece of bladder fastened on the end of a gum catheter, but which, on attempting to use, I found would not pass along the urethra. The first improvement was the addition of a moveable piece of ivory, upon which one end of the bladder was tied, and which piece of bone fitted the end of a hollow gum elastic bougie, to which the other portion of bladder was carefully affixed. This ivory was soon changed for metal, and the bladder for the muscular coat of the gut of the cat, which is very strong and thin, and as this in one trial gave way, and the metal end was left in the urethra, the metal was now made to pass the whole length of the gum bougie, which was also changed for a metal tube. Thus far the improvements were made by me, and the instruments were used in my room, Dr. Arnott being present. He after this prosecuted his inquiries with his brother, Mr. Arnott, who in 1821 published his observations on the subject, without mentioning the share I had taken in the matter. It was not worth while noticing then, nor would it be now, if I were not giving the history of the different attempts I have made to improve this part of surgery; and that Mr. Ducamp, a French writer, published a work in 1825, describing this instrument, and laying claim to it as an invention of his own, but to which it does not appear to me that he had any right, except that the instrument was unknown in France, but certainly not in England. As the gut became soft and yielded when wet, it became necessary to cover it with silk, or other unyielding material, and again with a smooth substance. In prosecuting my experiments, I soon found that filling it with air was a very uncertain business, and used water instead, which answered much better. In one case in which I used it, the bag slipped from the tube, and caused so much difficulty in withdrawing it, that my patient took alarm and left me; and in some others the effect was so uncertain, that it did not give the satisfaction I could wish. I now rarely use an instrument of this kind, either from its often failing, or being so troublesome, and placing the surgeon so much in the hands of the instrument maker, unless he has time and ingenuity to make them himself. I cannot say, however, that I think it has had all the justice done to it which it merits. In these observations there is however nothing new, I have made them every winter in my surgical lectures since the period I first used these various instruments.

On the Destruction of Strictures by Caustic.

It is not my intention to enter into the history of the different kinds of caustic which have been employed by our predecessors in surgery, or of the methods of using them; you will find them related at length both in French and English writers, to whom I refer you. I shall confine my remarks to the methods at present adopted.

The caustics now used are two, the *potassa fusa* and the *argentum nitratum:* the first has been almost entirely abandoned with respect to the urethra, and the other has fallen into unmerited obloquy and consequent disuse. You must not from this remark suppose that I am going to advocate its restoration to practice, for I do not intend to do any such thing; it would not be prudent to do so, even if it were proper; for the prejudices of mankind have been so greatly and effectually excited upon this point, that they must be gradually allowed to subside; they will not admit of being taken by storm. Like most other prejudices they have some foundation in truth, but it is the *abuse* of the argentum nitratum, and not the *use* of it, which has given rise to them. When a surgeon of reputation cures a number of patients by a particular remedy or remedies, his professional character is gradually, nay, sometimes rapidly augmented; more cases come under his observation, and many that are not susceptible of cure by the means he employs; he is nevertheless constrained or nearly so to use them, mischief ensues, and alarm is excited; it soon spreads, is fomented by the adversaries of the plan, and a mode of practice, which is really successful in many cases, is often abandoned from prudential motives. I honestly confess I dare not say to a stranger, whatever his case may be, and however useful a few applications of the argentum nitratum might be, that I mean to use it. I dare not do so until after a few visits, and we become better acquainted, and have more confidence in each other, perhaps only after he sees that he does not make much progress. I should lose my patient if I did, who would go to another, and might be told he had narrowly escaped the worst treatment in the world; an opinion he would not fail to repeat. Such is the prejudice against it among the younger men in London, that when a man says he has been cured by it, the remark is, how lucky you were to escape; I would not suffer any doctor to burn me for all the world. Nevertheless the argentum nitratum is a valuable remedy, when properly and carefully used in appropriate cases and not abused. It has been supposed, 1st, that the argentum nitratum takes off spasm and irritation; 2d, that it can destroy a long and narrow stricture; 3d, that it effects a permanent cure. The concurrent testimony of all writers establishes the first fact, and it is now almost the only object expected to be attained from its use. It is, however, capable of doing more when properly and carefully applied; and at some future period, when the prejudice which has arisen against its use shall have passed away, it will again take its place with other means, as a very effective remedy in certain cases of stricture. That it is capable of making a passage for itself, through a long, narrow, and impassable stricture, which has become hard, gristly, and irregular, through time and repeated attacks of inflammation, I do not admit. The attempt to do it, under such circumstances, has been frequently followed by the occurrence of great inflammation, the formation of abscesses, of fistulous openings in the perineum, and between the urethra and the rectum; of inflammation and abscess of the prostate and of the bladder, and of profuse bleedings, which with all or many of the preceding train of symptoms, gradually lead the unhappy sufferer to the grave. That the cure is more permanent than by other means may in some cases be the fact, but on the whole it is doubtful; and Sir E. Home, the great advocate for its use, in his later years and publications, admitted the necessity for the occasional passage of a bougie, in order to prevent a return of the complaint. According to his method, a bougie, the size or nearly so of the passage, was to be armed with caustic; and if one of this kind is used, it ought to be armed when the bougie is made, and not introduced afterwards. The distance from the orifice to the stricture having been ascertained and marked upon it, the caustic bougie should be oiled or greased, which is the best mode when caustic is used. A bougie of the full size, or nearly so of the urethra, is first to be passed down to the stricture to clear the passage, and after a minute or two withdrawn, when the caustic bougie is to be passed, and the end or point in which the caustic lies, and is barely exposed, is to be pressed against the stricture for the space of a minute. The first effect is to coagulate the mucous secretion of the part, forming with it a whitish soft substance, which has often been mistaken for a slough; the second is by its stimulus to relieve and remove the irritation existing on the surface of the stricture, so that the person often feels much easier after a slight application, makes water in a fuller stream, and is greatly surprised to find that the desire he suffered from to pass it every hour or two has been materially relieved. Sometimes however the effect is the reverse, and particularly where the application has been more severe, or the irritation has been of a nature not to be relieved by it. The part becomes more painful, the desire to make water greater, whilst the passage of it is altogether obstructed, or it passes by drops with great suffering, until, by fomentations, opiates, &c. the increase of irritation and inflammation has subsided. It acts therefore sometimes like a two-edged tool, and this has been another reason for its disuse; but it partakes on this point only of the property which all other remedies have of doing the same, and the fact inculcates the necessity for the greatest care and gentleness in its use. When the application is steadily continued to the surface of the stricture for a minute or more, its continued effect is that of a caustic, *viz.* the partial destruction of the part to which it is applied, and this must be thrown off by the usual processes of inflammation and ulcerative absorption, which separate it from the living part behind. When the stricture is slight and thin, or narrow, this will in general be effected without much inconvenience; but when it is thick and hard it will not often be done easily, for the inflammation will cause a greater thickening of the part, and the occurrence of the long train of evils I have alluded to, if not prevented by proper means and a speedy abandonment of the practice. If, however, the operation should be fortunate enough to succeed, the separation of the slough in the diseased part is often marked by a paroxysm of fever, or the occurrence of an alarming hemorrhage. The rigors with which the febrile paroxysm commences are strongly marked, and I am sorry to say take place occasionally even before the slough separates for the last time. They frequently occur after every application, or every one which has been in the least severe, and in such cases forbid its continuance. They are dependent on a particular sympathy which exists between the urethra and the system at large, and will occur as readily from violence as from the application of any caustic whatever. I know a medical man who had suffered from Walcheren fever, and who almost invariably had a paroxysm whenever caustic was applied, or a large bougie was used so as cause irritation; and the first paroxysm was always followed by others at regular intervals, so as to reproduce his Walcheren ague, which was only cured by the administration of bark, &c., in the usual way. This sometimes takes place in a less marked manner; and whenever the return of an irritation or pain is periodical and regular, quinine will in general, in combination with bark and opium, be found the best remedy when exhibited between the periods of illness. When a paroxysm of fever is about to be produced in consequence of the irritation caused by the introduction of too large a bougie, the desire to pass water is urgent, but the patient is incapable of doing it, and the accession of the cold fit shows the course of the affection. This will be best alleviated by a grain of opium and ten grains of camphor, but the most efficient remedy is to pass a small elastic gum bougie through the stricture and fix it in the urethra for a few hours: it takes off the irritation, and often seems almost to arrest the paroxysm of fever. It is a practice which should never be neglected in serious cases, although it is rather in opposition to prevailing theories.

The hemorrhages from the urethra are caused by the sloughs separating and leaving the cells of the corpus spongiosum exposed, or by the ulcerative process extending to some small vessel, the canal of which is partially opened. These, it is said, cease of themselves, although not until a great loss of blood has been frequently sustained, and it has been recommended to let the parts alone. I cannot give you any opinion formed from personal experience, as I have never seen one of these bleedings from caustic; but I conceive that they should be met and treated like hemorrhages from the same place from other causes, which appear to me to be of a similar nature.

The most alarming hemorrhages I have met with have been from common causes; and I will mention to you two of them of the most prominent kind, as they also point out the practice to be pursued in such cases. The first occurred in a gentleman living in Cockspur Street, who had had a catheter passed by a surgeon of great reputation and ability in the morning, without either pain or inconvenience. On his return home he found there was a considerable oozing of blood, which continued during the day, and induced him to send in the evening for his surgeon, who was unluckily out of town; the bleeding increased in the night, and in the morning early I saw him. There were several tubs of ice and water in the room, all apparently containing a considerable quantity of blood; his face was deadly pale, the pulse scarcely perceptible; and he said he had bled a pailful, which was of course an exaggeration. The bleeding was arrested in a few minutes by pressure applied in the proper place (on the perineum), and did not return.

The second occurred in the case of a tradesman, who had passed a common soft bougie for himself, the point of which had caught on some small opening, and it is presumed, had penetrated into it; he bled for two days and two nights, when I was desired to see him in Paddington Street. I found him kneeling in bed, and straining violently to pass his water, but which came with great difficulty, as the bladder contained a good deal of coagulated blood, which had passed backwards into it. He was as white as a sheet, and fell back in his bed, nearly insensible, almost as soon as I entered the room, having, as he said afterwards, passed several quarts of what (as it all coagulated) he considered to be pure blood. As urine and blood coagulate together when out of the body in equal proportions, it is probable that only half of it was blood. This bleeding was also arrested in a few minutes by pressure and did not return.

For the purpose of knowing where to make the pressure, any light, flat, and narrow, but firm substance should be prepared, such as a piece of cork, which can always be procured. The patient should then force all the coagulated blood out of the urethra; and as the bleeding usually takes place in these cases from that part which is anterior to the triangular ligament, pressure can readily be made upon it externally; but as it may be made a little before or behind the exact spot, in either of which cases it would be useless, the selection of that spot must be well made. This is done by beginning as far back as possible, and gradually bringing forward the finger by which the pressure is made. At a certain point the flow or dripping of blood will be arrested, and the precise spot from which it comes will be in all probability a little behind where the finger rests, a fact which can also be easily ascertained by carrying the finger a little backwards, when the blood will again flow. The bit of cork or pad can now be duly placed, and the patient should be desired to make pressure on it himself, and which he can often more readily do than an assistant.

When the hemorrhage comes from the prostatic part of the urethra or neck of the bladder, cold water, rest, and an opiate will suffice to stop it, provided it has been caused by some accidental circumstance, and does not arise from disease of a fungous or malignant nature, in which cases nothing can prevent its return, or even its continuance.

A gentleman sent for me, having passed a bougie for himself, which he was sensible was not only a little larger than his usual size, but that it had also caught on some fold at the entrance of the bladder, and had passed it with a jerk; a continued bleeding was the consequence, accompanied by an urgent desire to make water, but which appeared to be blood, or nearly so. The desire soon became more urgent, and the difficulty of passing any thing greater, until at last complete retention ensued. There appeared to me to be two evils; one, retention of urine from having passed too large a bougie; the other, hemorrhage and irritation of the neck of the bladder from having abraded a spot on its surface; and which was augmented by the sympathy which always exists between it and any very irritable part of the urethra. In order to relieve the retention, I passed a small gum elastic catheter, which drew off a quantity of bloody urine, and relieved the irritation and desire existing at the neck of the bladder, which soon afterwards subsided. I then directed an opiate to be given, and that he should shortly go to bed, and although some blood oozed from the urethra, and he passed dark coloured bloody urine for twenty-four hours afterwards, indicating that some blood had found its way into the bladder, the bleeding did not return; and I attribute the subsidence of it very much to the quietude of the bladder after the distress had been removed by the passing of the catheter. It is not long since you had in the hospital a case showing the nature of a hemorrhage of this kind into the bladder, from a blow on the urethra, and filling it up so as to create great distress. The proper practice to be pursued in such cases is to inject the bladder with warm water through a catheter with a single large eye on the side and a hole at the end, or by a double catheter, by the motions of which, in the first instance, the large coagulum may be in some degree broken up; when it is more readily dissolved by the water, so as to leave the urine quite clear in a few days, provided no more blood is poured into it.

When the hemorrhage does not come on from any distinct accidental cause, it may be difficult to ascertain from whence it comes. An old medical friend of mine passes occasionally dark bloody-coloured urine, which formerly gave him much alarm, and on account of which he has also consulted several gentlemen, eminent for their knowledge of these diseases, The blood was supposed to come from the kidney, and that it was really blood was readily shown by coagulating a small quantity in the urine by the application of heat, and he took many kinds of medicine in consequence without effect. As some little difficulty seemed to exist on the first attempt to evacuate the bladder, and as the bleeding might arise from the irritation caused by a small stone, it became necessary to examine the urethra and bladder. Nothing could be made out, save a slight difficulty on entering the neck of the bladder with the sound No. 12, and which part offered a positive obstruction to No. 14, surmountable only by a little management of the point of the instrument. He has in fact the bar, or dam, I have pointed out as occasionally forming at this part, independently of any disease of the prostate; and as he now finds that his urine is clear for many days together, and that he can always cause it to be a little bloody, either by passing a large bougie or by a little more than his ordinary exercise, he has acceded to my original opinion, that the blood comes from some enlarged veins at the neck of the bladder. He can now pass No. 14 through it with ease, and is much more free from the passage of blood than formerly. He therefore uses the solid silver sound once a fortnight, and has nearly abandoned that of internal medicine. I was led to believe that the veins of the neck of the bladder were enlarged, first from there being obviously some derangement of structure as well as of function at the part; and from perceiving that the veins of the nose, as well as those of the glans and prepuce were very blue and tumid, appearing as if they did not truly transmit their blood through them: and it struck me that those of the neck of the bladder might be in the same state. The sound only did good, or does good, by preventing the increase of the bar, and thereby rendering an undue action of the bladder unnecessary; the part is in fact at rest.

Hemorrhage from the neck or other part of the bladder may depend upon this simple source, or on one that is malignant. In the course of the last summer I saw a gentleman, in consultation with Dr. Prout, Sir Astley Cooper, and Mr. Brodie, who continually passed great quantities of blood, partly mixed with his urine, and partly coagulated. The clots of blood which came away were not, however, formed of pure coagulated blood, but were mixed with shreds, and apparently a medullary matter, which left little doubt of the hemorrhage proceeding from a fungous tumour of the bladder. He died soon afterwards nearly exsanguin, having returned home despairing of relief, and an examination after death proved the correctness of our suspicions. I had at the same time in the hospital a case of apparently equal danger, but which had a happier result. I take the history of it from Mr. Foot's case book, being one of those which obtained for him my prize of five guineas for the best selection and history of surgical cases which occurred in the hospital during the last year.

John Warner, ætat. 42, a brass-founder, was admitted into Percy Ward, under Mr. Guthrie, June 12th, 1833. Resides in Duck-yard, Duck-lane: is a man of middle size, and rather muscular; skin rather sallow; nervous temperament; has had gonorrhœa eleven or twelve times; has served as a marine twelve years, four years in the West Indies and four and à half in the East, but was never affected with any of the diseases of the country; he has suffered from bleeding of the bladder at occasional intervals for ten years; when it first came on he had a discharge, which he concealed, and for which he was not taking any medicine; he then came on account of the loss of blood under the care of the medical officer of the navy at Chatham, by whom he was attended for three or four weeks, and then discharged as incurable. He was told at the time of his dismissal that he had a diseased bladder and stricture. The hæmaturia after a time left him, and he continued well for six or eight years, when a drinking bout brought it on again. He was admitted into the hospital for retention of urine, which came on also after drinking to excess, to which he is rather partial; this was relieved by passing the catheter. Is not married; has not received any injury to the spine or abdomen; does not suffer from pain in the back or above the pubes. When the bladder is so far distended as to require its evacuation, it causes so much pain that if he is asleep it wakes him; he is immediately relieved by emptying it, and he cannot retain his water long, in consequence of the pain it gives him, which is chiefly felt near the frænum preputii, the evacuation being followed by scalding. The hemorrhage has returned only within the last few days, and he considers he loses a pint of blood daily; the fluid, when first evacuated, is of a bright red colour, as if it were all fluid blood, but after standing a while a separation takes place and the blood coagulates and falls to the bottom of the vessel. The stream of urine has generally been of a good size and never twisted or double. Tongue clean; bowels open;

appetite good; pulse regular, but rather jerking, 86; sleep disturbed.

15th. Mr. Guthrie passed a catheter, and said that there was a slight stricture in the urethra. He inquired concerning the shape of the clots of blood, and being told that they were round, he said that the round ones came from the bladder, but that those of a vermiform shape often came from the kidneys, or rather took the form of the ureter in their descent from it. He then ordered an elastic gum catheter, with one eye, to be passed and retained, care being taken that it did not exceed the commencement of the urethra more than one inch, for fear of injuring the coats of the bladder, but that it should be passed full an inch, lest the eye or hole should irritate the neck of the bladder, for which reason he said he had them sometimes made with a hole at the end only; a common bladder was to be attached to the end of it to serve as an external reservoir, into which the fluid might continually pass, and without effort, so as to prevent any accumulation and distention of the internal bladder. He was also ordered

℞. Sulph. alum. gr. iijj. Sulph. magn., ʒiij.
Acidi sulph. dil., gtt. v. Inf. rosæ. comp. ℥iss.
Fiat. haustus ter die sumendus. To be kept perfectly quiet.

Mr. White, who saw him afterwards, called his pulse the hemorrhagic one.

19th. Sleeps well, being undisturbed now by the notice to empty the bladder, which he used formerly to receive. The first night after the instrument was passed he could not keep it in, in consequence of the pain it gave him, and he was rather sulky when it was replaced; he did not at first approve of the second, or adventitious bladder, which he thus carried about with him; he is, however, now tolerably reconciled to it, and is convinced that he is improving; he suffers very little pain, and only at the frænum preputii; the stream of water is becoming clearer every day; the presence of the instrument has caused a slight discharge from the urethra. Medicines to be continued.

20th. Mr. Guthrie directed the removal of the external bladder, as it had produced the effect desired; to keep the catheter in and well plugged, its contents to be drawn off every hour; a large catheter is to be passed, as the urine dribbles away by the side of the one in the urethra.

22d. Continues improving; his water is clear, and he passes it in considerable quantity; No. 10 catheter has been passed into the bladder,

25th. Says he is getting well fast; can retain his urine three or four hours without pain; bowels kept open by medicine. The catheter does not cause any annoyance, it is not yet of the full size of the urethra, but to be gradually increased in size, so as not to induce irritation. Medicine repeated.

29th. The catheter was altogether removed by order of Mr. Guthrie. He can now retain his water for a long time (comparatively speaking) without pain or inconvenience.

July 9th. Dismissed cured.

I believe that as much good was done, in this case, by keeping the bladder perfectly quiet, and preventing as far as possible any action of it, by allowing the urine to flow always through the catheter. It is a mode of practice I have followed in other cases with success; and if the sulphuric acid and alumen had not proved beneficial, I should have substituted for them the powder of galls and opium, in imitation of Ruspini's styptic, which is supposed to be made of these articles, and which I have known to be advantageously used in these as well as in other internal hemorrhages, and particularly from the kidney, and in those which occur in females.

Dissatisfied with the application of caustic to the face of a thick and narrow stricture, I was, fifteen years ago, induced to try the effect of its application to the internal surface, by introducing it into the stricture. My attempts did not succeed in so satisfactory a manner as I could wish, the caustic rarely doing enough to be effective. The method I adopted was, to introduce a hollow silver tube into the stricture, with a single eye, which was placed in a narrowed part of the instrument, half an inch from its extremity, so that the sort of bulb thus formed, on being passed through the stricture, might, by catching or drawing it back, bring the hole or slit in the narrowed part or neck of it, just opposite the internal surface of the stricture. Into the tube a platina wire, carrying at a proper distance from its extremity a piece of caustic, moulded with a hole in its centre for the wire and duly secured, was passed, and it looked as if it would act well, but it did not do much; and as I rarely then or do now have recourse to caustic, it has been of late altogether disused. In 1825, M. Ducamp, of Paris, published a method by which the argentum nitratum was to be applied to the inside of a stricture also, and he was led to believe that he could accomplish this object, however small the opening was, provided it was passable. A model of the face of the stricture having been first taken, and the opening being ascertained by a portion of the modelling composition having entered into it; a hollow tube of gum elastic, graduated by inches and lines, was passed down to it, having an opening at the end, and these openings were not all made in the centre, but as far as could be imagined they corresponded with the openings which might take place in the face of a stricture; or one was made for each particular case. Through this opening a small spoon or curette was protruded by a stillet; and as it had been filled with argentum nitratum in powder, which was afterwards melted by the flame of a candle, he hoped it could then be safely applied to the inside of the stricture. It was found, however, to be difficult of application, indeed it frequently could not be applied; the curette, with every care that could be taken, would not enter the stricture, and the caustic was wasted on the surrounding parts.

Lallemand, in order to prevent this evil, made an alteration in the instrument, which brings it nearly to one of the ancient English ways of using the argentum nitratum. It is to introduce the caustic on a stillet through a tube or hollow bougie, so that when the armed stillet is duly placed in the tube it looks like a common bougie. This is to be introduced into the stricture according to a measurement previously made, when, by withdrawing the tube, the stillet being held perfectly steady, the end of it, which is defended by a small button forming the extreme point of the bougie, remains, and the caustic, contained in a similar spoon or curette to that of Ducamp, is exposed, and ready to be turned to any part of the circle which may require its application. This mode of proceeding is much more simple and easy of execution, as well as more effective than the other. It is liable, however, to this particular objection, that it cannot be used until a bougie of the size of No. 3 or 4 can be passed through the stricture, the effecting of which constitutes the principal difficulty in the cure, whilst all the other objections against the use of caustic, except that of making a false passage, remain in full force.

Lallemand says he has applied caustic in this manner to all parts of the urethra with success, and in one case he particularly specifies as far as the neck of the bladder and the prostatic part, at a distance of nine inches and a half from the orifice of the urethra, which was, however, naturally a long one. The relation of this cure, from page 60 to 91 of his work, is very interesting, and his subsequent remarks on the use of the argentum nitratum in diseases of the prostatic part of the urethra are deserving of attention, although the prejudices existing against that remedy in this country will not admit of their application, which is the less to be regretted, as the object may be attained by other, and apparently milder means.

With reference to the assertion that the use of caustic is followed by a more permanent cure than when any other mode of proceeding is adopted, much reservation is necessary. When the whole of the diseased part is destroyed by it, and it was not originally of much extent, I am inclined to believe that the statement is correct; and that there is less liability for a return of the complaint, than when the cure is accomplished by mere dilatation, although this is by no means certain. When the disease has been of long standing, and of some extent, the superiority claimed for the caustic cannot be admitted. I have three gentlemen now under my care, who had the argentum nitratum applied, one forty, one thirty-five, the other thirty years ago, by Sir E. Home, and they have had it done since, yet they all have now narrow strictures at the same place where they then existed. The occasional use of the bougie after the cure by caustic, is admitted, however, to be indispensable in most cases, even by its firmest advocates.

LECTURE X.

A STRICTURE is said to be impassable when an instrument cannot be passed through it, although there is still a sufficient channel open for the evacuation of urine, which trickles through in an insufficient and incomplete manner, giving rise to those symptoms of inconvenience and distress which have been already enumerated. It is said to be accompanied by retention or suppression of urine, when the stricture is so complete that nothing or only an occasional drop of water can be forced out. Under these circumstances different methods of treatment may be adopted, the selection or choice depending principally on the degree of difficulty experienced in the transmission of the urine.

The terms *suppression* and *retention* of urine are commonly and indifferently used to express an incapability of making water, although technically they imply two very different states; suppression being that in which no urine is secreted by the kidneys, retention denoting the impossibility of evacuating it from the bladder, in which it is retained in a compulsory manner. The degree of danger is not less different, although it is urgent in both; but it can be always removed in retention by a surgical operation, whilst it is often impossible in suppression to give relief by any hitherto known means.

It is not my intention to notice those suppressions of the secretion of urine which have been related by various authors to have occurred, as it were, spontaneously in individuals of peculiar constitutions; and in which some compensatory discharge took place from one or other of the various surfaces of the body, but merely those which are directly connected with the present subject. A great operation performed on any part of the body, such as an amputation, will often give rise to a suppression of urine for twenty-four or more hours, but this is usually obviated by opiates and diuretics with antispasmodics, in moderate but repeated doses, although when the patient has died from exhaustion, or the superadded shock of the operation, it has never been removed. It may occur from more trifling causes. I once laid open two fistulæ in perinæo of small extent, and without much difficulty, or almost any hemorrhage. The patient had made water just before the operation, and was seized four hours after, with a cold fit attended with shivering, of which he thought nothing. It lasted twelve hours, and was followed by a hot fit, in which he died in less than twenty hours after the little operation was performed. I examined the head, chest, and abdomen, but could find nothing to account for his death. There was no water in the bladder, nor had he passed any after the operation.

When the urethra is pervious the fact of the suppression is of course easily ascertained by the catheter, and the nature of the case is so far understood; and, as the bladder may, from paralysis or from over-distention, have become incapable of discharging its contents, the instrument should in all cases be passed, in order to verify the fact of there being no urine in the bladder. The cause of the suppression must be then strictly investigated. If dependent on alarm, it must be removed by the means indicated; if attributable to inflammation of the kidney, bleeding and proper antiphlogistic means must be adopted; and if it should depend on obstruction, the nature of it must if possible be ascertained, or relief cannot be expected. As one kidney is sufficient for the purpose of secretion, a suppression of the secretion in one kidney, or an obstruction in one ureter, will not be a positive cause of death, regarding it only as an obstruction; and I am not aware of any means of cure applicable to suppression from disease on both sides, unless such as nature may herself adopt. I have mentioned an instance in which a cancer of the uterus, extending to and surrounding both ureters, led to a suppression of the secretion, and death; but these causes are rare; and the particular ones to which your attention is especially required are those connected with the bladder. I have said, that when the bladder is forcibly dilated by the obstruction of the urethra on the one hand, and the secreting power of the kidney on the other, the peculiar mechanism at the orifices of the ureters is brought into action to prevent mischief, by compressing the necks of these orifices, and thus preventing, or nearly preventing the flow of urine into it. A suppression of the secretion is the consequence, and thus, if a person could survive long enough, he would die of the suppression of urine in all such cases giving rise to low fever, coma, and death, or to paralysis, or sudden death by apoplexy. The urethra, always almost however, yields, and the retention as well as the suppression is relieved; but, as the urethra does not yield for many hours, and in some cases in which it is not diseased and is capable of undergoing a high degree of irritation not for two or even three days, time is allowed for surgery to give relief, if its art and science are properly applied.

The question of time depends on the previous as well as on the present state of disease, and requires judgment in consideration as well as decision in execution. When the patient has suffered long from disease of the urethra with obstruction, and the bladder is very much thickened, it cannot dilate so as to hold any considerable quantity; and all the most violent and distressing symptoms may arise from ten or twelve ounces of water as readily as from two or three pints, and in twelve or eighteen hours as well as in six-and-thirty, or in three days. The size of the bladder being but little augmented in this case, offers no assistance to the judgment: it can scarcely in fact be felt either above the pubes or through the rectum; and it is on the agony of pain experienced by the patient, and the state of constitution as expressed by his appearance, and the general symptoms, that the practitioner must depend as his guide. In such a case the patient will rapidly be exhausted, and irreparable mischief will be done to the parts or the constitution, unless relief is early obtained by a surgical operation. Judgment in discrimination and decision in action are here two most valuable qualities in the surgeon; and as soon as he sees that the patient is not likely to be relieved by more simple remedies, he ought not to wait until the danger is so far augmented that he has not a moment to lose, or until great mischief is done, but should proceed whilst there is still time, and the system is but little impaired by the attack, to do that which must be done at a later period, when it may be useless. Fifteen and eighteen years ago I was in the habit of seeing many more serious cases of this nature than at present. The surgery of these parts has been greatly improved, and relief is sought for and obtained so much sooner than formerly, that the same number of bad cases are not now met with. No operation that can be performed or attempted can do half the mischief that will inevitably follow the rupture of the urethra by ulceration and an extravasation of the urine into the surrounding parts, whilst it also saves the constitution at the moment, and may also be the means of effecting a permanent cure, or at least a great alleviation of the evil. The question of time, then, must be one founded on many observations made by the bedside of the patient. I shall say to you, as a guide, as I have said to you in strangulated hernia, that the operation had better be done a little before it is absolutely necessary than a little afterwards; and I beg of you to remember, that these cases very rarely occur, except in persons who have had strictures for a series of years, and which have long been to them a source of great misery and danger.

In all other instances I may confidently state to you, as a general rule, that operations are never necessary, the symptoms being relievable by more simple means.

In the management of common cases of retention of urine, a difference of opinion exists among the best surgeons of the present day; some making a marked distinction in the local treatment of those which appear to have occurred from the supervention of inflammation, and others not. This relates principally to the use of the catheter; the phlogistic surgeons deprecating its use until the inflammatory symptoms have subsided, when it no longer appears to be necessary. The other party, of which I profess myself to be a great supporter, use the catheter as a means of reducing inflammation, as an antiphlogistic measure.

If a young man who has been long suffering from gonorrhœa, the inflammation of which has extended to the back part of the urethra, goes out, and exposes himself to cold after drinking a quantity of champagne, *punch à la romaine, &c.*, he often finds himself unable to make more than a few drops of water, or even to make a single drop, although the desire to do so is most urgent. That the inflammatory affection of the urethra has been augmented no one disputes, but many recommend that in such cases the patient should be bled, put into the hot bath, that an enema should be administered, with calomel and opium, &c. &c., before the catheter is used. I hear this continually said by men of great experience in the profession, and however much I may respect their opinions generally, I cannot but think they are in error. Relief is at last obtained by these means, it is true, but not until after much suffering; whilst the catheter, when used at once, takes off the irritation of the bladder, and removes the spasm, or irregular action of the muscles surrounding the urethra. When the bladder is quieted by the evacuation of its contents, the other remedies may be more advantageously employed, and will require to be carried to a much less extent. The catheter in such a case need not be of the very smallest size; and although a gum elastic one is the best, a silver one will often answer very well; and if one is not at hand, a common bougie may be passed gently through the urethra, and allowed to remain for a few minutes, when the patient should be desired to make an effort as it is withdrawing, when the water will be found to flow.

A tradesman came to me yesterday evening, suffering from great irritation in his urethra, with an incapability of passing his urine, except by drops; he had been taking cubebs in large doses, and had exposed himself to cold. I advised him to be cupped on the perineum, to take a dose of physic, a hot hip-bath, and to go to bed. He returned to me this morning, saying that he could not pass a drop of water, and that he was suffering great pain, with a sensation of bursting. I immediately passed a No. 4 silver catheter; it went into the bladder without the slightest hesitation, and drew off two-thirds of a chamberpotful of water. What would bleeding or any thing else have done?

Suppose that the patient has a stricture, the nature of which you are acquainted with; say that it will admit of a No. 4 bougie, that it has been irritated by attempts to pass a larger one, or from any other cause, and the patient cannot make a drop of water.

This is a case in which inflammation has supervened from violence, and the person will be in great distress, which will remain undiminished for hours under any other treatment than the passage of the catheter, which will at once give him relief. A No. 2 or 3 will often pass with ease in this kind of case, although scarcely a drop of water can be made.

When you are unacquainted with the state of the urethra, and know nothing further than that the urine has been evacuated with difficulty, or in a very small stream, you will often be foiled in your attempts to get into the bladder, and you must then have recourse to general means, when it is said you have added to the mischief which already existed; but I am not satisfied that you have done so if you have proceeded with that caution and gentleness which are necessary, and which I have so strenuously enforced throughout my observations. The patient is also better satisfied, and he submits with more patience to the delay and misery he must endure, before he can obtain relief, whilst, if you succeed, he at once says he is in heaven. If the obstruction is in the first five inches, or from that to five inches and a half, take a very small straight gum elastic catheter, and try it with, and afterwards without, a stillet, bringing the urethra well forward as you introduce it, until it is quite upon the stretch. By varying the motion of the two hands the point of the bougie may be applied to every part as nearly in succession as possible, with the hope that it may find the opening. If it should do so, it passes on to the bladder, and the patient is relieved; but do not withdraw the catheter, the smaller it is the greater the necessity for leaving it there. The general symptoms will not be increased by it, or if they are, they may be subdued by general means. The eyes of the catheter should be introduced so far into the bladder that they may not irritate its neck; and if the bladder itself should be so irritable as to render its presence very distressing, it may be withdrawn from the bladder, and yet retained in the urethra just beyond the stricture, ready to be passed onwards if required. This is however rarely necessary, for the urine flows readily by the side of it, if the catheter is kept through the stricture. In two or three days the size of the catheter may be increased, and so on until the cure is completed, or the urethra is restored at least to its natural dimensions. I once, some years ago, introduced a small catheter into the bladder of a gentleman in a case of this kind, and gave him instantaneous relief, but unfortunately withdrew it. The retention of urine did not return, but he made his water with great difficulty, and it was three months before I could again hit the opening and commence the cure. The passage of a bougie or catheter often however causes all this mischief, as I have already stated, and it may then be its own cure by being retained in the part. A medical friend of mine has had stricture for some years, for which he has been treated by caustic in Paris, and by other means in other places, without effecting a cure: latterly the stricture has become very narrow, and every touch or application to it of any kind whatsoever was sure to bring on a paroxysm of fever or a fit of retention of urine, which lasted several hours, so that at last he dreaded it being touched in the gentlest manner. I assured him that all this evil arose from the urine passing over the irritable surface of the stricture, and that he must keep the catheter in the bladder so as to prevent its occurrence. This he did, and as the instrument was of the smallest size, the urine soon flowed by the side of it; a larger one was introduced, and in this gradual manner the irritability, both of the stricture and of the bladder, have been overcome, and he can now pass a No. 8 and his water at all times with ease. When the catheter appeared to irritate the bladder, he partly withdrew it, and after the first two increases of size, he used only a hollow gum bougie, which went just beyond the stricture, in a manner I shall hereafter notice.

When the obstruction is beyond five inches and a half, or is at the curve of the urethra, the small gum catheter should be also made to take a proper curvature; and as it is so small that it can have but little stability, I usually try it with the wire, which even then only gives it a moderate degree of firmness. When a larger one is used, and by having been retained on a wire for a long time it keeps its curvature, it may be used without it, but it does not appear to me to be so manageable an instrument, as its point cannot be retained so readily against the upper surface of the urethra, or directed so easily to any particular part. It may however gain, on the other hand, from its flexibility, and the surgeon should have both kinds ready for use. If, after several careful and steady attempts, the gum catheter fails, a small catgut bougie may be tried; if it can be made to stick in the stricture, it will soon soften and swell, and dilate the anterior part of it; and as the whole of a stricture relaxes on the dilatation of a part, the urine may and often will flow on the bougie being withdrawn, particularly if it be done during an effort to evacuate it, by which act it is forced against the back part of the obstacle.

If the catgut bougie fails, a common plaster one may be used in a similar manner; if a catgut is not to be obtained, recourse must be had to the silver catheter, and the surgeon should be provided with them of two or three curvatures different from that I have described to one much less bent, for one will often proceed when the other will not; they should have a pure tin stillet, and a wooden handle with rings, and be about ten inches long. This instrument is to be passed slowly and steadily down to the stricture, the patient either standing or lying on his back, as may be consonant to the usual practice of the surgeon. The catheter must not be too large, or it cannot go through, and if too small at the point it will easily take a wrong direction, and make a false passage, if undue force be applied. The point of the instrument, when it reaches the stricture, should be pressed against it, in order to ascertain the distance; it should then be directed against the lower part of the urethra, and then against the upper, with the view of obtaining a sufficient estimate of its situation. It should then be withdrawn an inch, when the parts being put fully on the stretch, it should once more be passed onwards, the point being borne against the upper surface of the urethra until it reaches the obstacle, into which it may perhaps by gentle pressure, be insinuated. The

French surgeons have been in the habit of using a sharp-pointed conical catheter, which they forced through the stricture, or something else, and frequently got into the bladder in this way; but this plan should never be followed. It cannot be doubted that some force is necessary, because pressure is force, however gently it may be applied, and men have different ideas of what is or is not gentleness; but a very little practice soon teaches a surgeon what is the extent of it, in the shape of pressure, which he may use without the risk of tearing the urethra, and the sooner he acquires this knowledge the better, because beyond that he must not go. This gentle degree of pressure must be continued for several minutes, until the instrument passes on, or the incapability of overcoming the resistance by fair means is obvious. If the urethra is torn the mischief is increased, for the instrument will always take that course; but a little bleeding is not a sign of laceration, for the stricture is very vascular as well as sensible, and blood readily flows from a very moderate examination, even without pressure. A surgeon cannot tell what another has done who has preceded him; but he must know when the urethra has yielded from laceration effected by his own hand. The best directed efforts having failed, the patient if a vigorous man should be bled from the arm: he should invariably be cupped on the perineum to the utmost quantity that can be obtained, and which rarely exceeds twelve ounces; or a dozen or twenty leeches may be applied in relays, so as to keep up a constant drain from it, and which bleeding may be encouraged at intervals by the hot hip-bath, or, if the patient wishes rest, by an evaporating bread and water poultice. The bowels should be evacuated by a large enema of salts, gruel, and castor or other oil, repeated from time to time if necessary, until the rectum becomes perfectly clear. Opium is now to be administered; sixty minims or a drachm of tincture of opium are to be put into two, but never more than three ounces of gruel, or warm water, and injected into the rectum. The quantity is small that it may be retained, which would not otherwise be done if it were larger. Batley's solution of opium or laudanum is also to be given by the stomach, twenty minims for the first dose, and ten for the succeeding ones, every hour or two hours, as may appear most proper to effect the object of bringing the patient quickly under its influence. It is contended by some that opium introduced into the rectum acts more powerfully than when taken into the stomach, but it has not been the case under my observation, and I always calculate that double the quantity is the proper dose, whether it be used in the fluid or solid state. When the patient is fairly under its influence, and the cure is to terminate favourably, the irritability of the bladder diminishes, the urgency of the calls to make water are neither so severe nor are they so frequent; the patient slumbers for a few minutes betwen them, a state of general relaxation takes place, and a few drops of urine follow each other more rapidly than formerly, soon to be succeeded by a small but uninterrupted stream; after which the patient dozes or falls asleep, and is only awakened to obtain perfect relief by emptying, or nearly emptying the bladder.

The effect of the first or large purgative enema is sometimes great; it brings on the due consent between the parts, and often gives rise to complete relief. If it does not quite do so at once, the opiate injection generally completes it. Purgatives, therefore, are valuable aids, and many persons liable to slight attacks of retention, have recourse as soon as they begin to feel a difficulty in passing their water, to a strong dose of salts, senna, and manna, and a hot-bath, which usually give the required relief. The hot-bath is a very great assistance in many cases, and is useful in all. I always, however, recommend it much hotter than is commonly done, at 100 to 104, or as hot as the patient can conveniently bear it, and he should remain in it until he is quite faint.

These various means must be continued and repeated, although in vain, until it is obvious that they are insufficient, and that relief must be obtained by some other and more strictly surgical proceedings. The urine may perhaps drop from the urethra, the patient may be able to collect and show half or even a whole wine-glass full, the bed-clothes may be wet from it; but this will not do, it is not that sort of evacuation which is absolutely necessary to give relief. The kidneys secrete more than is discharged, and are willing to secrete still more, if the pressure on them which prevents it were taken off. The bladder is distending in spite of this stillicidium, and the rupture of the urethra is at hand. The agony which the patient endures is great, the anxiety of countenance is strongly marked, the general distress, the great sympathy of the whole system are too fearfully expressed to be mistaken. The bladder may be felt rising high above the pubes, and descending into the rectum, if it has been capable of dilatation, and the surgeon has only the choice of his operation left. Four are recommended by different modern authors: 1st, To puncture the bladder above the pubes; 2d, Through the rectum: 3d, To open the urethra from without: 4th, To divide the stricture by an instrument passed along the urethra.

The operation above the pubes is dangerous, inasmuch as an extravasation of urine may readily take place after it, and lead to the formation of matter and other evils of serious magnitude; it should never, therefore, be had recourse to in cases of retention of urine from stricture. The operation through the rectum is easily done, and is not liable to the same objections, except in the case which cannot be foreseen, of the peritoneum descending between the bladder and rectum lower than is usual; I may say, except in some particularly rare instances which scarcely form exceptions to the general rule. It is, therefore, the operation which is to be preferred by those who are unacquainted with the anatomy of the parts in the perineum. The best mode of doing it is to cause the patient to lean over the side of the bed, when the fore-finger can more readily be introduced into the rectum until it touches the prostate through it. The posterior boundary of this gland being distinguished, the curved trocar and canula are to be introduced, the point of the trocar being withdrawn under cover of the tube until the end of it rests by the side or under the fore-finger a little beyond this part, and about or rather short of the middle of that which is called the triangular space. The trocar covered by the canula is now to be carried steadily into the bladder, when the trocar is to be withdrawn, and the canula pushed forward so as to secure a free evacuation of the urine. The canula may now in turn be withdrawn, as its remaining would only cause irritation, and can be of no use, for the opening from the rectum into the bladder will always remain open until the canal of the urethra becomes pervious. There is more danger that it may never close, but degenerate into a fistulous opening, than of its closing too soon; and this is another and the princpial objection to the operation. It is also urged against it, that the disease in the urethra is not removed; but it must be clearly understood, that the disease in the urethra is much more manageable when the pressure upon it of the bladder is taken off, and may in my opinion be almost if not always successfully treated, and the canal cleared or rendered pervious in a short time afterwards, by permanently placing an elastic hollow bougie in it in the manner I shall presently indicate. This is therefore the operation, I repeat, which is always to be selected by surgeons who are not conversant with the anatomy of the perineum; but I do not say it is the best for those to select who have a greater degree of knowledge.

The operation of opening the urethra from the perineum in cases of retention of urine may be a simple one or otherwise, depending principally on the situation of the evil. If the stricture be anterior to or at the commencement of the bulbous part of the urethra, nothing can be more easy for any one to do; and the facility with which it can be done in this situation has led to some misconception with regard to the operation generally. Sir Astley Cooper, who claims the introduction of it into the practice of surgery, directs a sound to be passed down to the stricture, the point of it is then to be turned downwards, and an incision made upon it and beyond it. If the stricture is a narrow one, the dilated urethra behind it will be brought into view; or, if otherwise, it is to be sought for and opened, when the urine will be evacuated, the patient immediately relieved, and time given to treat the stricture itself; which, as I have said, after the puncture through the rectum, is much more manageable, in consequence of the forcing of the bladder against it being removed. In the first case in which he did it, in the year 1793, he merely made an incision through the common integuments, when the dilated urethra came into view; this he opened with a lancet, allowed the urine to escape, and the patient was soon cured of his disease. If things were always as simple as this, a very few minutes' consideration would suffice. But this is not the case: and it is admitted by the ablest surgeons that when the disease is situated at the termination of the bulbous portion of the urethra, or in the commencement of the membranous part, and it is not easy to say what a long-continued disease may not do by extension to the neghbouring parts, the operation is often exceedingly difficult: it is more particularly so when it is attempted by making an incision on the left side of the raphe of the perineum, nearly in the same manner as in the operation for the stone.

From the stricture preventing the passage of the catheter, the information to be gained from its presence in the urethra is wanting; the hardness and derangement of the soft parts, which in these cases has often taken place, adds to the difficulty; and the urethra behind may not be sufficiently dilated to make it very tangible, so that it is not so easily found, rendering in many instances the operation one of great difficulty, and deterring therefore many persons from doing it or any other. In most cases the urethra behind the stricture only is divided; and where the operator is determined to carry his catheter on into the bladder, it is probable that he does not always divide the strictured part of the urethra, but carries it on by the side of it, establishing, perhaps, a false passage at the part, which will for the time take the place of the original one, and which will also it is probable lead subsequently to a recurrence of the evil.

The improvements which have been made of late years in the practice of surgery render this operation less necessary than formerly; cutting out, or cutting into, portions of the urethra, which I have seen attempted, are like cutting out testes, comparatively obsolete operations; but still, an opening into the urethra may occasionally be required; and when the disease is situated at the termination of the bulbous portion of the urethra, or even further back, I recommend the operation to be done in the following manner, as much the most simple and certain. The patient being placed and secured, as in the operation for the stone, a catheter or sound is to be passed down to the stricture, and held steadily against it, the concavity being as usual upwards, the point directly applied to it. The rectum having been previously cleared by an enema, the fore-finger of the left hand being duly oiled, is to be introduced into it, and the membranous part of the urethra and the prostate are to be examined as well as the bladder, the state of which will in all probability have been previously investigated. If the membranous portion of the urethra is dilated by the urine, so much the better; but the object of introducing the fore-finger is to ascertain the relative situation of the upper part of the rectum and the urethra, which latter part only touches, or is nearly in direct application to the rectum, at the termination of its membranous part and the commencement of its prostatic portion. There is a certain distance, which is greater or less in different individuals, between the last inch of the rectum and the urethra placed above it. The two parts form two sides of a triangle, the apex of which is the prostate, the base the external skin. It is within the two lines of the triangle that the operation is to be done. The surgeon, taking the catheter in his right hand, whilst the fore-finger of the left is applied to the upper surface of the rectum, moves the point upwards and downwards, so as to communicate with the fore-finger of the left hand, and to convey to it a knowledge of the situation of the extremity of the instrument; and particularly of the distance between them, which the motions given to the catheter by the right hand will clearly indicate. The thickness of the parts between the obstruction and the rectum can be estimated with sufficient accuracy, both at the point where the left fore-finger is applied, and at the surface of the skin; for, although the membranous part of the urethra cannot be easily felt from an incision made on the left side of the perineum, it can always be distinguished from the rectum. The next step of the operation is to divide the skin, cellular membrane, fascia, muscular and tendinous fibres, which may intervene between the upper surface of the rectum and the under surface of the anterior and middle portions of the membranous part of the urethra. This is to be done by a straight, blunt-backed, narrow, sharp-pointed bistoury, fixed in its handle; and there are two ways of commencing the operation: the first, when the obstacle is behind the bulb and the external parts are not diseased, may be done by a straight incision, in a perpendicular direction; in which manner the operation may always be done if the surgeon is well acquainted with the anatomy of the parts; but if he is not, or they are very much hardened, and consequently unyielding, a transverse, curved, or crescentic incision should be made across the perineum, the centre of which corresponds with the raphe, and is one quarter of an inch above the verge of the anus, or as near that distance as may be, with due respect to the rectum. This gives room, and allows the parts to be separated as much as they will admit. If the transverse incision is not adopted, the point of the straight bistoury is to be placed on the skin a little above the verge of the anus, the cutting edge being above, the blunt back towards the rectum, the handle being a little depressed, the point a little inclined upwards. The degree of inclination necessary to carry the knife inwards for the distance of an inch, and clear of the rectum, will be indicated by the finger in that part, and the eye of the operator will correspond with the point of the fore-finger, so that the bistoury may be steadily pressed in to that extent, and then carried upwards, and brought out in the exact median line, making an external incision of at least an inch and a quarter to an inch and a half, as regards the external parts; and which may be then extended as space is wanted for the prosecution of the operation. The part being sponged, the surgeon again introduces the bistoury in the median line, the point being directed upwards and backwards towards the urethra, and he may then deepen the cut. The fore-finger in the rectum will always tell him where the back, and consequently where the point of the bistoury is. The opening will now be sufficiently large to allow the operator to lay aside the knife, and to feel for the urethra with the point of the fore-finger of the right hand, an assistant keeping the catheter steady against the stricture, the end of which will now be readily felt. If the point of the fore-finger of the right hand does not go beyond it and touch the sound part of the urethra, which is dilated by the urine in the generality of cases, the knife is to be resumed, and the fore-finger being withdrawn from the inside of the rectum, is to be placed in the wound, on the outside of the rectum, which is to be depressed as much as possible; the back of the knife is then to be turned to it, whilst the point exposes and opens the urethra, and which it can do very easily near the apex or transverse portion of the prostate, or at the termination of the membranous part of the urethra; but it is not necessary to go so far back, and the membranous portion may be opened at its middle with every advantage, and with perfect safety to the gut. A good anatomist and surgeon will open the urethra in this way sooner than the mode of doing it can be described, the urine will make its escape and the patient will be at once relieved. Whether the stricture shall be now divided or not, is a question presently to be considered: but the cure can be completed either with or without it.

The young surgeon (and I never speak or write for old ones), in order to understand the method of doing this operation, should dissect the perineum, first in the usual manner, and make himself well acquainted with the central tendinous point, as it is called, to which the transversi perinei, the acceleratores urinæ, the sphincter ani, and the compressor urethræ muscles are attached. This being divided, and the acceleratores muscles being separated in their median line, they ought to be turned aside, when their deeper structure can be examined, as well as the bulb of the urethra which they cover. The sphincter ani muscle, both in its superficial and deep part, should now be carefully investigated, in connection with the bulb of the urethra and its attachments to the deep perineal fascia. A side view of the pelvis should then be obtained, and the relative situation of the parts duly estimated, and which a dissection from within the pelvis outwards will confirm and establish in the mind. The most important dissection is yet, however, to be made, and it is to be done by placing the body on the face and raising the pelvis, so that the parts are elevated and made more tense. The sacrum is to be exposed with the edges of the glutæi muscles, the coccyx is to be cleaned, all the loose fat taken away, and the sphincter and levator ani muscles are to be fully exposed from behind. The manner in which the levatores ani cross from side to side to make the funnel-like process usually described is then well seen; but they make principally the body of the funnel, leaving a tube extending from it of an inch and a half in extent and sometimes two inches, entirely cut off by it from the cavity of the pelvis; and a student can have no idea of the possibility of cutting away an inch of the extremity of the rectum, or of the safety with which he may divide an inch and a half of it, unless he makes this dissection. It is true that the tube of the funnel, or the gut, is also covered by the fibres of the levator, intermingling with those of the sphincter, but these do not interfere with the view of the subject I have given, as the inside of the levator is lined by a fascia, which is reflected upwards on the side of the rectum, prostate, bladder, &c., which separates these parts from all beyond or below them. The sacrum should be now sawed through and removed, the levatores ani carefully examined and divided in a median line on the rectum. The sphincter ani should be treated in a similar manner, and the whole of the lower part of the rectum exposed. This gut should now be turned backwards, the recto-vesical fascia being divided in a similar manner; this being done, there are still muscular fibres, fasciæ, and cellular membrane to be dissected and divided before the membranous part of the urethra, the prostate, the vesiculæ seminales, the back of the triangular space of the bladder are brought into view, and this dissection is most important and difficult. If the perineum has not been in part dissected it should be done, and the connection of the superficial with the deep-seated fascia should be demonstrated. The first and last dissections of the perineum will demonstrate all the points I have alluded to in the operation, and will also enable the student to prepare himself for dividing the neck of the bladder, if such an operation should be found necessary.

This is the operation in the perineum I have performed and recommended for years, but it sometimes happens that the surgeon prefers cutting on the face of the stricture with the view of dividing it, supposing he will have less to do, but in this he will be frequently disappointed. If the stricture is at the posterior part of the bulb he must divide that part to get at it, a thing I believe of no sort of consequence, and leading to no inconvenient result, although the contrary has been asserted. On opening the urethra he finds he is probably half an inch from the stricture, having cut on the point of the catheter turned downwards; this half inch must be divided, and in fact, a nearly similar operation to that I have recommended must be done, only in a dissimilar manner. When the stricture is exposed, a small lachrymal probe may be passed into the canal I should say in all cases, and the stricture must be divided upon it; but as the urethra at this part descends under the pubes, the surgeon, if not well informed, fears injuring the rectum, within one inch of which he is not, and he begins to hesitate, and to divide, scratch by scratch, or to try and introduce a director by force, and which may and will more easily pass in any direction by the side of the urethra than through it. If he has a very small director he may with little force pass it over the lachrymal probe, directing it downwards, and thus reach the membranous part of the urethra; the sharp-pointed bistoury may then be run along the director, and be made to cut transversely to each side, then downwards, and lastly upwards if necessary, until a straight or female catheter passes easily into the bladder. If the surgeon has unhappily begun his operation in this way, and cannot get a director into the stricture, he should now introduce the fore-finger of the left hand into the rectum, and having ascertained the relative situation of the line of the rectum and of the urethra, and the incision he has made; he will obviate the difficulty by steadily pressing on the straight blunt-backed bistoury through the stricture, the edge being turned either upwards or sideways, until the urine begins to flow, and his large director can be passed, care being taken to preserve as much as possible the course or line of the canal. In fact he must do at last, after half an hour has been lost, nearly the same operation which I have advised to be done at first.

LECTURE XI.

The question of dividing or of not dividing the stricture after the urethra has been opened behind it, is advocated both ways by many very able men. The fact of the stricture becoming much more manageable after the irritation caused by the pressure of the bladder has been removed, has induced many to trust to the ordinary treatment in order to effect a cure; and as in cases where the bladder was punctured through the rectum or above the pubes, no other method could be adopted, and yet the canal was ultimately rendered permeable, it must be admitted that this mode of proceeding is a good one in many cases. I should say that it is, like many others in surgery, a question of degree; that this method may be adopted in all cases where the stricture is of no great extent, but that it should be divided in completing the operation in all cases in which it is of a thickness, hardness, or extent, leading to the expectation of the cure being difficult or prolonged: for it must be borne in mind, that the incision in the perineum soon closes up, so as to become a very small opening, no better indeed than a fistulous one if the passage is not cleared; and that any particular delay in effecting this object, will bring the parts into the state they are in when a fistula in perineo has taken place from other causes, and which alone often requires another operation of nearly a similar nature for its cure. The patient also, in submitting to an operation, expects that the obstruction from which he has suffered so much should be divided; and unless it can be proved that some particular advantage will result to him from not doing it, or not having done it, he will not be satisfied with his treatment nor with his surgeon, if he has to undergo another, from whatever cause it may arise.

If the stricture has not been divided, a catheter is never passed from the perineum into the bladder; but if the stricture has been divided, it is usual to introduce a catheter immediately into the bladder, which is sometimes good and sometimes bad practice. When there is but little irritation in the bladder the catheter will do little mischief, but when there has been low inflammation of its mucous membrane existing for some time, which is generally the case, the presence of the instrument gives rise to the greatest suffering, and to so much constitutional derangement as often to lead to the destruction of the patient. In no case can it do good as far as the bladder is concerned, and in many it will inevitably do mischief, more particularly if a silver one be selected instead of an elastic gum catheter, for the end of it necessarily rubs against the upper surface of the irritable membrane and increases the evil, whilst it otherwise does no kind of good.

The particular advantages expected from the introduction of a catheter, are those of keeping the whole passage open, and of allowing the wound to heal over it, so as to re-establish the canal; advantages which I by no means undervalue, but which I well know may be attempted to be gained at too great a risk. The rule is, in my opinion, therefore peremptory, that a catheter of any kind is not to be introduced in cases where the mucous membrane of the bladder is very irritable; or if introduced, is to be withdrawn as soon as it is found to give rise to an increase or even a continuance of irritation. As soon as the incision into the urethra is completed, the urine will flow through it, and will continue to do so for several days, without the opening being so closed up but that it may be seen when the urine is discharging through it. During the period of this discharge, an elastic bougie may, if necessary, be introduced for the space of an inch or two, and retained there by an appropriate bandage, as it will not prevent the urine flowing by the side of it; or a gum catheter or bougie may now be carried along the passage until it reaches the divided part. It is then to be passed into the posterior portion of the urethra, beyond the incision, but not into the bladder; and if it is not carried into the bladder it will not give rise to irritation. None but those who suffer can know the relief which is obtained by withdrawing a catheter one inch from an irritable bladder, and no precise direction can be given on this point; it must depend on the feelings and sensibility of the patient. I have seen a man with an irritable bladder draw out the catheter and throw it away in despair, although he knew he should not be able to pass his water an hour afterwards. The present agony overcomes all feeling for the future, until that future in turn becomes the present. The relief obtained by allowing the instrument to remain in the urethra instead of the bladder is often great, and it answers every purpose just as well, and can be advanced at any time if necessary. The mechanism required to retain a catheter or bougie at a given distance is simple. The catheter should rarely exceed eight inches in length, and may sometimes be shorter, as it never should project half an inch more than is necessary. It should have a silver extremity to which two rings are affixed, and to each of which a piece of strong bobbin, ten inches long, is to be attached. The catheter being introduced to the proper distance, the two pieces of bobbin or strong thread are to be carried backward along the sides of the penis as far as the pubes, and a narrow slip of sticking plaster is then to be bound round the middle of the penis and over them, so as to fix them firmly to it, and which the sticking plaster does as well as any thing else. The ends of the bobbin or thread are then to be turned forwards on the outside of the plaster, when they may be tied together on the end of the catheter, which is thus steadily fixed in its place, subject, however, to any motion of the part generally with which it moves as a whole; and the patient soon learns to manage the matter for himself, so as to change it whenever he pleases without inconvenience; or an elastic band may be sewed or buckled around the penis, with hooks attached to it, through which the threads may run.

There are still two advantages supposed to be obtained by dividing the stricture from without, and by introducing the catheter through the part, and which may be gained by this mode of proceeding. The one is, that the presence of the catheter causes the absorption, and of course the removal of much of the diseased urethra; and that the division of the outer wall renders it less liable to a return of the disease than if the cure had been accomplished by any other means. The first point I admit: the second is doubtful; for I may say I have as much evidence on one side as on the other. In the course of the last thirty years I have had many opportunities of dividing, and more of seeing the urethra divided by others, for the relief or cure of persons labouring under strictures. In most of these cases the disease has returned in the course of a few months, or would have returned if the patients had not made use of the solid sound regularly every five or six days to prevent it. In the year 1816 I saw the late Mr. Pearson divide a stricture at the part where the scrotum begins, for the extent of an inch, or as much as was hard and gristly; the patient got quite well, and could pass a large bougie with ease; but he subsequently neglected himself thinking it unnecessary, and one year afterwards I saw him just as bad as he had been before. I find in my case-book two admirable instances of this disease, and of this mode of treatment, and in both the complaint would have returned if not prevented by the use of the bougie. They were under the care of my colleague, Mr. White, in the Westminster Hospital, and I assisted him in the different steps of the very difficult operations they required. In these cases a considerable portion of the urethra, upwards of an inch in length, had become nearly impassable to the urine, and wholly so to the smallest-sized bougie, and accompanied with fistulous openings. The urethra in both had also become excessively indurated, and nearly obliterated to the above extent. It was in vain to make further efforts with the view of ameliorating or restoring the healthy condition of the urethra by the ordinary means of caustic and other bougies of every description. It was now proposed to lay open the whole length of the indurated and diseased urethra, beginning anteriorly at the sound termination of that passage, into which a staff was previously passed, and to carry the incision through the whole length of the disease, and as far as the point where the urethra again became pervious and healthy.

The disease in both cases was situated behind the scrotum and near the bulb. The patients were placed in the same position as for the operation of lithotomy, and the middle line of the urethra freely and deeply divided through the entire indurated extent, probably upwards of an inch and a quarter; in both a straight short female catheter was then passed from the lower or posterior part of the wound into the bladder, and subsequently a small leaden catheter was introduced by the orifice of the urethra through the new-made wound and into the bladder. The incisions in both cases were not long in healing over the leaden catheter, and the surrounding structures quickly lost the indurated and almost cartilaginous condition which had been caused by perpetual irritation from the escape or infiltration of urine. Both the cases eventually recovered; but it was found necessary for a very considerable time subsequently to introduce the leaden catheter daily, for whenever that was neglected there was evidently a disposition in the new-made passages to become contracted. In both instances the disease returned, and the necessity for the occasional use of the bougie was demonstrated in the strongest manner.

A friend of mine (now no more), the late Dr. O'Halloran, of the 60th regiment, suffered for many years from stricture; and fifteen years ago took particular interest in the improvements I was attempting to make in the bulbous instruments, so as to cause them to dilate when introduced into the urethra, and was one of the first on whom they were used. They did him no good; and from neglect of the common sound his stricture contracted, so that he suffered great inconvenience from it, and being in the West Indies, was rendered almost incapable of duty. Being a man of great resolution, he determined on dividing his stricture from the outside, and placing himself before a glass he opened the perineum, just behind the scrotum, until he had completely divided it. He assured me, some years afterwards, that the cure was complete, and that he had never since had occasion to pass an instrument.

The division of a stricture by an instrument passed along the canal and down to it has been often tried and as often abandoned, until of late, when the practice has been revived by Mr. Stafford in very obstinate cases. The general surgical opinion is against it, as being exceedingly dangerous, although I do not think it merits the reprehension it has met with, and may in some cases be advantageously employed. The mode of treatment I have adopted for impassable strictures has rendered it unnecessary to have recourse to it unless the case is so very urgent from retention of urine that no delay can be admitted. In such instances a surgeon if he fails in dividing the stricture from within must do it from without. If he succeeds, he should introduce a catheter into the bladder, and allow no urine to pass along the urethra for three or four days, as I have known several severe paroxysms of ague follow its doing so; and if any evil consequences should take place, it is still but opening the urethra from without. The ill consequences alluded to have, I think, been over-rated; and the most that can fairly be said against it is, that if it does not suceeed and does no good, it does little harm, and the patient is not in a worse state than he was before.

In cases of passable narrow strictures, which are very troublesome from their irritability and propensity to contract, the division of them is sometimes followed by remarkably good effects; but poor patients, even in hospitals, do not willingly submit to the operation; and many in higher life have so much dread of any thing of the kind, that the practice is only likely to prevail in very severe cases.

When the surgeon is unhappily too late, and the urethra has given way by ulceration behind the stricture, the urine makes its escape into the surrounding cellular texture in the perineum; but as this part is bounded posteriorly by the superficial fascia, which turns under the transversi perinæi muscles to join the deep fascia, the urine can only pass upwards and forwards; it distends, therefore, the scrotum, the integuments of the penis, and often extends even into the cellular structure above the pubes, and into the groins. It has been usual in these cases to scarify the parts deeply so as to allow the urine to drain off, and await the event; but this is not sufficient; a fair and free incision must be made in the perineum, in any way the surgeon may choose according to the nature of the case, until the superficial fascia is fully divided, and a free and direct passage for the urine is obtained; so that there may be no possibility of its escaping into the surrounding cellular structure on account of the dependent outlet which is made for it. The urine being the natural stimulant of the bladder, exercises none but its ordinary power on it; but when it is extravasated, and leaves the natural passages for the cellular structure surrounding them, it gives rise to unhealthy inflammation and mortification to the extent to which infiltration has taken place. In order to prevent the complete destruction of these textures, it is not sufficient that incisions be made for instance, into the scrotum, or the surrounding integuments, with the view of facilitating its evacuation; or that it be even pressed or squeezed out, but the further admission of urine must be prevented, by making such a depending opening as will allow it to run directly off without the least impediment. A solid sound or a catheter should be passed down the urethra to the stricture as a guide; and if it be as far down as six inches, an incision is to be made in the perineum, on either side, as may seem preferable, and nearly as in the operation for the stone; this is to be continued inwards, until the finger can distinguish the point of the instrument in the urethra, in front of the stricture behind which is the rupture or hole in the urethra; and the parts must be so divided that the urine will run directly out without further infiltration. In these cases it will always be better to divide the stricture if possible, and to carry the catheter into the bladder, from whence the urine may be drawn off from time to time, provided the presence of the catheter does not cause too much irritation.

The destruction of parts by the urine is so rapid, that few survive an extravasation of this nature, unless the art and science of surgery are brought almost immediately for their relief and assistance, so that the urine may be pressed out as quickly as possible, and the entrance of any further quantity be prevented. I am aware that in such circumstances it may be said, that the patient will inevitably die, if an elderly man and of a bad constitution, in spite of all that surgery and physic can do for him, and it will in all probability be truly said. Still the fact is, that in one case he must die, in the other he may not; and an enlightened and well-educated surgeon must estimate his patient's strength and constitution, and proceed accordingly. I never recommend an unnecessary operation, but I have done operations successfully, and seen them done successfully, when abler men thought they must be useless. The preparation before you is from a man advanced in life, who died in this hospital through an accident. He came in very ill with retention of urine. I passed a gum catheter, which surmounted an obstacle without much difficulty about six inches down, and drew off his water, mixed with blood, mucus, and a purulent deposit. The gum catheter gave to the finger the sensation of passing over or through a rough, gristly body, which I thought it had done, and it was fixed in the bladder. Early in the evening, however, it slipped out of the bladder, and the patient, thinking he could do without it, attempted to make his water in the natural way, and forced it into the scrotum, penis, and surrounding parts. It was not discovered by the house-surgeon until the morning, and when I arrived in the middle of the day, he was sinking so fast, that any operation would have been as cruel as it would have been useless. He died shortly afterwards, and on examination of the parts, the urethra was found pervious for a good-sized catheter which I had used; but a stone had passed from the bladder, and had embedded itself on the under part, and eventually gave rise to ulceration in it, through which the urine escaped into the cellular texture and destroyed him, already nearly worn out by long-continued irritation. The inflammation induced by the ulceration had caused the retention of urine, and if I had used a silver catheter, instead of a gum elastic one, or if it had not so readily passed into the bladder, I should have discovered the stone, and removed it by an incision at once. The great object I have in view in mentioning this case, is to show that such an extravasation is not always caused by stricture, and that the removal of the stone by an incision would have prevented the evil, inasmuch as the urine would have escaped through it, after the catheter had slipped out of the bladder, if one had been placed there.

After the operation has been done, and the safety of the patient has been so far ensured, your attention must be turned to his general state. Saline medicines, or gentle saline aperients with opiates, will be the best remedies to soothe and allay the constitutional irritation which has taken place; a stage further, camphor, opium, with saline draughts made with the carbonate of ammonia, will be advantageous, and if gangrene has taken place, ammonia, brandy, quinine, acids, and opium, will offer the best chance of success; but all will and must be useless if the passage of urine is not free, so that no further extravasation can take place. The incisions into the parts distended by urine should be sufficiently long and deep to allow the urine to be squeezed out of the scrotum, and to drain out where pressure cannot be applied; and if the cellular membrane has sloughed, they must extend into the slough. Poultices of stale beer and linseed meal are the best applications, followed by stimulating dressings; but the treatment will be tedious, the whole skin of the scrotum being frequently lost, and a fistulous opening remaining in the perineum.

Erysipelas will sometimes attack the scrotum, and simulate the appearance derived from extravasation of urine. I was once called to a case of this kind, in which the scrotum was greatly distended, and I was at first sight disposed to attribute it to that cause, but the patient declared he not only could make his water well, but had never had any difficulty in doing it. I was not, however, satisfied until I had passed a catheter and assured myself that there was no disease in the urethra, nor in the perineum. The patient recovered, but lost a good deal of the skin of the scrotum by sloughing, in spite of several incisions into it, which saved the remaining portion.

A pervious urethra is, however, no proof that an extravasation of urine may not be caused by ulceration in it, but then the extravasation does not take place quickly; the scrotum and adjacent parts are not suddenly distended; the swelling commences slowly, is situated in the perineum, where its progress is marked by pain and hardness. It is owing to inflammation, which has taken place outside the urethra, ending in suppuration, and the matter of which cannot find its way to the surface, in consequence of the superficial fascia, which prevent its progress. The pain is often great, the irritation greater, and there may be and often is retention of urine, although the passage is pervious for a moderate-sized elastic catheter. If a lancet is pushed into a swelling of this kind it always gives relief, although no matter should follow for a day or two. If matter should follow, the relief will be great, and a little urine will be observed to trickle through a day or two afterwards. In some cases the urine starts forth with the matter to a distance on opening the abscess, but even in this case the inflammation, which existed previously to the ulceration of the urethra, will have consolidated the cellular structure, and an abscess will be formed in the usual manner, with its proper sac retaining and preventing the flow of urine from it. This abscess is to be prevented by rest, leeches, fomentations, and the usual antiphlogistic means, without meddling with the urethra; but as soon as the formation of the matter of the abscess is certain, the sooner it is opened the better. The wound in it, as well as the ulceration in the urethra, will sometimes heal with the simplest after-treatment. In other cases the external wound must be laid open and dressed from the bottom with slight stimulants, whilst a catheter must be kept in the bladder or urethra, in order to prevent the urine passing through the wound; for the encouragement of the granulation of which, caustic applications, and even the actual cautery, by means of a wire heated to a white heat, have been strongly recommended. Many surgeons advise in these cases the dilatation of the urethra, beyond even its natural size. It has appeared to me, from the consideration of very many of them, that this mode of proceeding is objectionable; that the urethra should be dilated, where a stricture exists anterior to the ulcerated opening, is consonant with my views: if the natural size of the urethra is as 12, a No. 13 may be used until it passes easily, but a No. 11 should be had recourse to when it appears desirable to expedite the closing of the ulcerated part. I do not see, I confess, what advantage is to be gained by over-distention and the separation of the ulcerated edges, whilst I think I can perceive the good which may be derived from allowing them to remain in contact. The catheter should be large enough to prevent the flow of urine by the side of it, but not so large as to distend completely the canal. The spot when healed will always be liable to re-open on the recurrence of a much less degree of irritation than that which originally gave rise to it. If a considerable portion of the urethra, anterior to the fistula, is impervious, it must be divided, the bladder at the time of the operation being as full of water as it can hold, so that the posterior, or ulcerated opening into the urethra, may be seen on the patient's discharging it, during which process a small director can be introduced, and the orifice, if necessary, enlarged, so as to admit a proper catheter. When a portion of the urethra has been lost, in a circle or nearly so, it is a very difficult thing to establish the canal, and sometimes a fistulous opening will remain even when the largest bougie can be passed with ease. Pressure on the orifice of the fistula will often in these cases prevent the inconvenience which would otherwise arise from it.

LECTURE XII.

When a stricture is impassable by the bougie, but is permeable by the urine, although it flows with difficulty, I have of late years adopted a mode of practice which has never failed in my hands to clear the urethra, and to effect a passage into the bladder, without giving rise to the evils attendant on the use of caustic, or to the alarm and anxiety which attend the operation of dividing the stricture by any of the means which have been hitherto adopted. The introduction of a bougie into the urethra, and its retention against the surface of a stricture, have invariably been recommended as an effective means of overcoming a retention of urine, by taking off what is usually called a spasm; and thus causing the contracted part to yield, so that the urine sometimes flows through it, or the bougie gradually dilates it, and passes on into the bladder. On one occasion, some years ago, in a case of difficulty of making water from stricture, I fixed an elastic bougie in the urethra at night, and was much pleased, on calling on the patient early in the morning, to find that it had passed through the stricture, and that the urine flowed readily by the side of it. I was induced to make this trial from the consideration of the effect produced on a stricture by the dilatation of the part immediately anterior to it by Dr. Arnott's dilator, and which is invariably to improve the flow of urine; in other words, to enlarge the stricture by means of the dilating influence operating on the sounder part in front. One trial naturally led to another, each being more successful than its predecessor, until I supposed I had made a discovery of considerable value; I soon found, however, that the Baron Dupuytren was, and had been pursuing the same plan in Paris, and I believe with as much success.

It might at first sight be supposed that the continued presence of a bougie must give rise to a greater degree of irritation than previously existed, and in all probability to a complete retention of urine. It does however exactly the reverse, it calms the existing irritation, and, after a few hours, if the patient becomes sensible of any difference, it is that his water passes more freely than before. I am quite satisfied of this fact, and believe it to be indisputable as a general rule. The foundation of the method of treatment is built upon it, and if it were not firmly assured the superstructure must fail. The dilatation, nay, the mere separation of the sides of the urethra without any especial dilatation, has an influence of a very favourable kind on a stricture, and may, without being carried further, effect a diminution of the contraction in slight cases, so as to allow a bougie to pass with little difficulty. In severe cases, the dilatation of the canal in front of a stricture does but little unless the dilating substance touches the stricture itself, a fact I have had proved, by finding that a bougie may remain for months in a false passage, beginning immediately in front of a stricture, without exerting upon it any perceptible influence.

The best dilating material is a hollow gum elastic bougie, of a medium size, perfectly smooth, and tolerably round at the point, so that it may give as little uneasiness as possible. A very small bougie gives more annoyance than a larger one, is retained with more difficulty, and is more likely to give rise to irritation, in which case it should be removed, and after a little delay, replaced by a larger one. If this should also give rise to irritation, which rarely occurs, it should also be removed, and the irritation subdued by warm fomentations, by opiates, and perhaps by the application of a few leeches. There are very few cases which require any thing more, provided the patient will be perfectly quiet, live moderately, and preserve the recumbent position, until the irritation has subsided, when he may sit up and walk about his room in his ordinary manner. The bougie is to be fixed in the urethra in the same way as a gum elastic catheter is fixed in the bladder; it should project about one inch beyond the orifice of the urethra, and rather less than more. The point should press against, or rest upon the stricture with the greatest possible gentleness, so that it may not give rise to inflammation or to ulceration, and yet should press just so much as to cause absorption. It is an admitted point in the animal economy, that new-formed parts, whether laid down in reparation or in disease, do not resist a stimulus in the same manner as parts of original formation. They are in fact removed by the action of the absorbents under the application of a stimulus, which has little or no influence on those parts which have undergone no change, and are coeval with the existence of the individual. The pressure made by the point of the bougie, and which ought always to be an elastic one, should therefore be nicely regulated, so that it may do this and no more. It is a point which requires attention, and some little experience, although a due knowledge of it is soon acquired. It should never be so great as to give pain, or indeed uneasiness, and yet it should be continual. The patient readily learns what is wanted, and as he can feel when the surgeon cannot, he soon understands how to manage the bougie himself, and can take it out, wash it, change it, or replace it, as he pleases. If he is a very restless, fretful, or naturally irritable man, it may prevent sleep or prove inconvenient, in either of which cases it may be removed for two or three hours, at the pleasure of the individual, whose private affairs may otherwise render this indulgence necessary. It does no harm, it is merely a little delay, which prolongs the time requisite to effect a cure.

If the pressure is made by a stiff, unyielding instrument, inflammation and ulceration may be the consequence, and many evils may be the result; but then this is the abuse of the practice, not the adoption of it, and forms no part of that which I have recommended. The pressure, according to my views, must be so nicely regulated as to cause absorption, but not to give rise to ulceration, and I firmly believe that it may be graduated in such a manner as to fulfil these intentions most accurately. When the objects stated are duly accomplished, the patient soon perceives that the stream of urine is enlarged, that it comes more freely, and that the general irritation of the bladder and of the neighbouring parts has diminished. The principal and most satisfactory sign of amendment is the more ready flow of the urine; and although the bougie should not advance, the amendment on this point is often progressive, until at last the bougie is either found to have passed through the stricture unknown to the patient, or is gently pressed through by his own hand, or by that of the surgeon. The time necessary for the accomplishment of this object must be longer or shorter, according to the extent and nature of the disease, and the state of the constitution of the patient. The object is effected in some cases in from three to six days, in others the progress is slow, although evident, and it may require as many weeks, but in no case that I have met with has the practice failed. When the canal is thus rendered pervious, the cure is only half completed, although the most difficult and dangerous part has been accomplished. The stricture has yielded in its centre, but not in its circumference, and two courses may be pursued; one is to increase the size of the bougie, so that it may press on the circumference of the anterior part of the stricture until it causes its removal; the other is effected by passing the bougie through the stricture, and gradually enlarging it, thus pressing on the inner circumference, in preference to its anterior surface, which method I prefer. When the bougie has passed through the stricture, I always carry it into the bladder, and then replace it by a catheter, the use of which may or may not be continued at the pleasure of the surgeon. The catheter is not necessary to draw off the urine, as it flows as readily by the side of the bougie, but it proves that the instrument is in the bladder, and it is always a great satisfaction both to the patient and surgeon, to see the urine flow through it. I have a gentleman now under my care, whose stricture has been overcome in this way, but in whom the point of a small bougie almost always enters into one of the openings of the ejaculatory ducts, and that of a larger one catches on it, and will not often proceed without a little management. If the error be committed of allowing the bougie to lodge in one of these openings, inflammation will in all probability be communicated to the testis, and there is always a chance of such an accident occurring when the orifices of these ducts are irritated even by the instrument resting upon them. If a catheter is used, the eye of the instrument should pass fairly into the bladder for half an inch at least, but it is better to use one made with a hole at the extremity; and when the instrument is not in the bladder, and it cannot always be borne there, it should be withdrawn, so as to lie in the membranous part of the urethra, with the point near to, but not irritating the prostate gland. It will often remain in that situation quietly, when it cannot be advanced without producing the greatest irritation. In some instances where this has taken place, the instrument must be altogether withdrawn until it has been subdued, when it may be cautiously replaced. The greatest evil, however, usually arises from increasing the size of the bougie too rapidly; and this is a point to which the greatest attention must be paid, whilst it is the error into which both surgeon and patient most frequently fall, as I have stated when treating of the cure by dilatation. It is, then, the point which requires the greatest nicety of management; and this can only be acquired by observation founded on experience. The irritability of the inside of the stricture, and the part adjacent but posterior to it, is sometimes greatly augmented by the urine which passes over them. This is frequently diminished in quantity as well as altered in quality, being loaded with salts and other matters which render it extremely irritating; and unless it be brought more to its natural state, little or no progress will be made in completing the cure. The diet of the patient must be then an object of particular attention, and the urine should be tested from time to time, in order to ascertain its nature; and the general treatment must be strictly continued until it is found to have lost its irritating qualities, when there will be a fair prospect of completing the cure. The presence of the bougie gives rise to a discharge, which is greater or less according to the state of irritability of the patient; but it is never accompanied by pain, unless inflammation is brought on either by accidental circumstances, or from the size of the bougie being too rapidly increased, so as to distend the canal beyond what it can readily bear.

When the urethra is rendered pervious, the attempt to enlarge the strictured part too rapidly, always brings on pain, irritation of the neck of the bladder, and so much suffering that it cannot be borne; and the large bougie must be withdrawn, and time must be lost, before one a size or two smaller can be used in its stead. This, as I have stated, is the error you will be most likely to fall into, and it is therefore the one you should most carefully avoid. If you will recollect what I have said on the question of effecting a permanent cure by dilatation, you will perceive that it cannot be accomplished unless a bougie is passed occasionally, so as to take off the disposition to relapse, which lasts for a considerable time, and which should be always borne in mind. I have in my hand the history of the cases of three medical men who have been cured in this way: they are of great interest, and particularly the first; and I selected those of medical men from a great number, because it may be supposed they understood better what they were about than other men, and that they are written by themselves.

June 20th, 1831. A. S ——, M. D., aged 38, has had stricture in the urethra for eighteen years past, and has been under the care of many of the most eminent surgeons, at different times; but no instrument has ever yet been passed into the bladder, with the exception of a very fine catgut bougie, which Mr. Piele, of Dublin, at one time passed, but could never introduce again.

In 1824, he was affected with severe rigors and fever, recurring twice a-week; and about this time retention of urine for forty-eight hours occurred. The caustic bougie was repeatedly used, but was discontinued on account of the rigors that occurred after each application of it. After this, in 1825, the dilating plan was followed for some months, with an evident improvement in the general health, and an increased stream of urine. From 1825 to 1830 the complaint was much better: occasional attacks of inflammation in the urethra occurred, which were generally pretty easily got under by the application of leeches to the perineum, and the use of the hip-bath. On August 14th, 1830, was seized with great pain and irritation about the neck of the bladder, and great difficulty in passing water, which came in very small quantity at a time with great straining. These symptoms did not yield to the repeated application of leeches, the hip-bath, anodyne enemas, and suppositories of opium and extract of belladonna; but continued to increase and become more alarming until the 22d, when urinary coma came on, and it was deemed necessary to puncture the bladder above the pubes, which was done without delay, and a very large quantity of thick, stinking, mucous urine drawn off: in about three hours afterwards the coma subsided, and things seemed going on well for a couple of days, when an abscess began to form in the perineum: this increased for two days more, and fluctuation being perceived, an incision was made into it, and a quantity of extremely stinking matter discharged. In a day or two afterwards, another abscess made its appearance on the right side of the scrotum, into which an incision was made, and a table-spoonful of pus escaped. After this, another abscess formed in the right groin, and was opened as soon as fluctuation was perceived. These sores all healed kindly and well in the course of eight or nine weeks; but during this time a very severe rheumatic fever came on, which lasted fourteen or fifteen days, and was attended with great suffering. The recovery after this was very slow; the urine began to come away a few drops at a time by the natural passage; the catheter, which was introduced through the puncture into the bladder, was changed about once a-week. It was now attempted to dilate the urethra by the occasional introduction of bougies, and afterwards of graduated sounds, which has been continued up to the present time, but without being able to get any instrument through the stricture into the bladder.

June 22d, 1831. Mr. Guthrie introduced a gum-elastic catheter down to the stricture, and, having fastened it by a belt round the penis below the glans, left it there with its point pressing on the stricture, and about an inch projecting beyond the extremity of the penis. The passing of the instrument occasioned some pain, and in the evening there was heat and uneasiness along the course of the urethra, which was relieved by taking a draught with twenty-five drops of the Lancaster black drop.

23d. Passed a quiet night; slept well towards morning; the instrument has kept well in its place; some uneasiness and irritation in the urethra; pulse a little hurried; having kept very quiet in bed all day the uneasiness and irritation were nearly gone in the evening, when the instrument was withdrawn, washed, and replaced; repeated the anodyne draughts; and took a pill of extract of colocynth, five grains.

24th. Slept well; catheter kept well in its place, and caused very little uneasiness; kept quiet in bed all day; removed, washed, and re-introduced the catheter; draughts and pill repeated at bed-time.

25th. Going on as yesterday; keeping very quiet in bed.

26th and 27th. Keeping very quiet; the catheter is going a little farther in.

28th. Had an uneasy night; pain and heat along the urethra, and irritation at neck of bladder, which were relieved by removing the cork from the puncture-catheter above the pubes, and allowing the urine to trickle away in drops for the space of four hours; repeated the pill and anodyne draughts, with forty drops of the Lancaster black drop.

29th. Heat and pain of the urethra and irritation of the bladder subsided; parts feel easy, and the instrument has gone further in; draught and pill repeated at bed-time.

30th. Instrument still farther in; draught and pill repeated.

July 1st. The instrument is still advancing, and not causing any uneasiness; draught and pill repeated.

2d. Puncture-catheter changed, the other advancing; repeated draught and pill.

3d. Instrument still advancing a little; no uneasiness; draught and pill omitted.

4th. Slept well; instrument advancing.

6th. Instrument in as far as it can go; changed for a longer; it appears, on measurement, that it has penetrated an inch since its first introduction.

7th. The new instrument keeps its place, and produces no inconvenience.

8th, 9th, and 10th. Going on well; no uneasiness; keeping very quiet.

11th. A good deal of irritation at the neck of the bladder in the night, so that the instrument had to be withdrawn; after which some urine came by the urethra two or three times with considerable straining, and then close on half a pint in a better stream than had been made for many years, and with much less exertion.

12th. Made water in an improved stream frequently, by the natural passage.

13th, 14th, and 15th. Stream of urine continues to improve.

16th. A small-sized gum-elastic catheter passed with tolerable ease into the bladder, and was left in.

17th. Some uneasiness about the neck of the bladder; urine runs both through and along the side of the catheter.

18th. Uneasiness and cutting sensation about the neck of the bladder.

19th. No. 2 catheter withdrawn, and No. 4 introduced with little difficulty into the bladder.

20th. Uneasiness about the neck of the bladder much diminished since the introduction of No. 4; the urine runs both through and along the sides of it.

21st. No. 4 withdrawn, and No. 6 introduced with little difficulty in its stead.

22d. Urine ran along the sides of the catheter during the night.

23d. No. 6 withdrawn, No. 8 introduced with little difficulty, but occasioned a sensation of great distension along the course of the urethra.

24th. In the afternoon, considerable pain and throbbing in the perineum; withdrew the catheter until bed-time, and then put in the short instrument used previous to the introduction of No. 2; urine passed in a large stream when the catheter was out.

25th. Withdrew the short instrument, and introduced No. 8 with great facility; some pain in the perineum in the afternoon.

26th. Pain in perineum, which increased with a good deal of swelling towards the evening, when the catheter was withdrawn. Eight leeches, and afterwards a poultice, applied to the part. An anodyne draught and pill at bed-time.

27th. Swelling increased; poultice continued; repeat the draught.

28th. Tumour broke, and discharged some matter; poultice continued.

29th. Discharge continues; poultice continued. Introduced No. 6 catheter, and kept it in six hours.

30th. Discharge much diminished. Catheter would not pass into the bladder. Great needing, which was relieved by keeping the cork out of the puncture-catheter for two hours.

31st. Catheter could not be introduced. Introduced the short instrument at bed-time. An anodyne enema taken during the night.

Aug. 1st. Catheter, No. 6, passed easily into the bladder.

2d. No. 6 still in; some irritation at the neck of the bladder. Took an anodyne enema, and kept the puncture-catheter cork out for two hours.

3d. No uneasiness to-day. No. 6 still in.

4th. Catheter, No. 7, introduced. At night great uneasiness about the neck of the bladder occurring at short intervals; took an anodyne enema, which not removing the uneasiness, the catheter was withdrawn, and the short one introduced an hour afterwards, and worn in all night.

5th. No uneasiness; introduced No. 7 catheter again.

6th. No uneasiness; withdrew the catheter, and passed water in a large stream three or four times. Introduced the short instrument at bed-time.

7th. No. 8 introduced with ease; a good deal of irritation at night, which was relieved by an anodyne enema, and keeping the cork out of the puncture-catheter for about an hour.

8th. Had a good night after the enema; quite easy all day.

9th. No. 8 still in; quite easy.

10th. No. 9 pewter catheter passed easily, but occasioned so much pain about the neck of the bladder that it was withdrawn in two or three minutes.

11th. No. 8 gum catheter introduced.

12th. A No. 10 pewter catheter shortened was introduced with ease, which occasioned a good deal of irritation and needing at night; relieved by an anodyne enema.

13th. Slept well after the enema; easy to-day.

14th. Removed the pewter No. 10, and introduced an elastic gum of the same size. A little uneasiness and needing at night; relieved by an anodyne enema.

15th. Got ease and slept well after enema. Withdrew the catheter in the evening and walked out for an hour; greatly fatigued after the walk; a sensation of rawness along the urethra. No. 10 gum catheter introduced at bed-time.

16th. No. 10 removed and No. 11 pewter catheter introduced without difficulty; after being in some time there was uneasiness near the neck of the bladder, which was relieved by an anodyne enema.

17th. Slept well; quite easy to-day; withdrew No. 11 in the evening and walked out for an hour. Great rawness along the urethra after making water, which continued all the evening.

18th. Kept out the catheter all day; urethra feels very raw.

19th. No. 10 elastic catheter introduced, as No. 11 pewter would not pass.

20th. Withdrew the instrument in the evening, and introduced it at bed-time.

21st. No. 12 pewter catheter was passed without difficulty into the bladder, but produced so much uneasiness that it was withdrawn in the course of two hours and a half, and a gum elastic one of the same size introduced in its place.

22d. Some pain in the perineum; withdrew the catheter, and applied seven leeches; an anodyne enema at night.

23d. Slept well; pain quite gone; No. 12 flexible catheter introduced into the bladder.

24th. No. 12 in.

25th. No. 12 still in; a good deal of irritation about the bladder; an anodyne enema at bed-time.

26th. Withdrew the catheter, and walked out during the day; introduced it again in the evening, and kept it in fourteen hours.

27th. Catheter in for twelve hours to-day.

28th. In for ten hours.

29th. In for eight hours; withdrew the catheter from the puncture above the pubes entirely, which had been gradually diminished in size for the last four or five changes.

30th. Catheter worn six hours. Some urine came away through the puncture during the night.

31st. Only a few drops of urine passed through the puncture to-day; comes by the urethra in a very large stream.

Sept. 1st. Catheter No. 12 passes with great ease; puncture entirely healed.

2d. Catheter No. 12 in for two hours, urine comes away in a full stream, and the health is better than it has been for the last ten years.

On the 21st Dec. 1833, he writes to me, saying, that he is quite well, passes his urine in a free, full stream, and introduces a No. 11 silver bougie once a-week.

For eleven months this gentleman scarcely passed a drop of water through the urethra, but wore a gum elastic catheter in the wound above the pubes, which he fastened with sticking plaster against the abdomen above the umbilicus; and through this he made water when he felt a desire, and which he experienced in the natural and usual way. He felt his situation so wretched, that he came to London determined to submit to any thing which might place his life even in jeopardy, if the hope of a cure could be held out to him.

The following is the case of H. H. surgeon, as related by himself.

"I have had strictures about ten years, but suffered little inconvenience from them until within the last five years, during which time the pain and frequency of passing my urine has gradually increased, so much so that I could get but little rest of a night, being often obliged to get out of bed eight or ten times to make water; attended with a great discharge of matter from the urethra, and the urine depositing a thick mucous sediment immediately it was passed. The attacks of ague which I have had at irregular intervals for the last five years, increased in frequency and violence as the strictures got worse, sometimes having them once or twice a week for the last two years, and an attack always followed the introduction of a bougie. All the remedies tried for the ague had no effect in preventing them, until I placed myself under the care of Mr. Guthrie in March. On the 31st of March Mr. Guthrie divided, at my desire, the first stricture, which produced but little irritation, and the ague which came on about two o'clock the following morning was very slight and lasted only two hours, whereas before the operation, I did not recover an attack under twenty-four hours, and I have not had the slightest return of it since. April 4th. Passed bougie down to the second stricture, and kept it in about eight hours a day. On the 12th got it through the second down to the third without much irritation; the urine passed much better and in a larger stream, and seldom having occasion to make water during the night. 21st. The pressure of the bougie on the third stricture very painful for about an hour, when it became suddenly easy, and I removed the bougie, which was followed by a great discharge of matter, and the urine flowed in a full stream without pain; passed a bougie at night into the bladder with little difficulty, and have worn one six or eight hours a day, gradually increasing the size to No. 8, which, on the 16th of May, gave me no pain in passing it into the bladder. I keep it in about four hours a day, and can pass my urine in a full stream without the slightest pain or inconvenience, and consider the strictures perfectly cured. I am now in much better health than I ever remember to have been.

"24th May, 1834."

This case shows a combination of means. The division of the first stricture, which was always passable to a No. 4 bougie, and was a mere thread, although a very irritable one, removed the ague. The second stricture was the impassable one, and the source of his great urinary distress, and the cure scarcely occupied more than six weeks; but then I do not consider him quite cured although he does, and he ought to pass a bougie occasionally for some months.

S. L. surgeon, has been severely affected with stricture for many years. At the age of thirty-two he contracted a gonorrhœa and a swelling of the left testis, which gradually yielded to the application of leeches, fomentations, warm baths, and the antiphlogistic regimen. Some months subsequent to this period, he perceived a diminution in the stream of urine and a more frequent desire to void it, accompanied with slight pain. A surgeon of eminence introduced a bougie into the urethra, when it was ascertained that a stricture existed at its bulbous portion. The treatment with the common bougie on the principle of dilatation was directed, and its application persisted in until the strictured part was dilated to its ordinary diameter and he appeared perfectly cured. A bougie was occasionally introduced for some weeks, and as the urine flowed perfectly free and without pain, its further use was discontinued. In his thirty-sixth year symptoms of stricture again made their appearance; he made water more frequently than usual, attended with pain during its expulsion, a heavy sensation in the perineum, and a mucous discharge from the urethra; recourse was again had to dilatation of the stricture, which was gradually effected, and the discharge from the urethra had nearly ceased, when by exposure to cold he was attacked with a complete retention of urine. The patient being at the time in Paris, M. Dupuytren was sent for, who introduced a flexible catheter into the bladder and drew off about sixteen ounces of water, which gave great relief. The catheter was retained in the bladder for three days and then withdrawn, and replaced by one of a larger size, which was continued for three days more; a bougie à ventre of two and a half lines was introduced an inch through the stricture every night for some weeks, until the urine passed naturally and in a full stream, when the patient was pronounced cured. In less, however, than twelve months, all the symptoms of stricture returned with increased force, and as it was now evident the treatment by dilatation alone could only procure temporary relief, the patient was induced to try the method by caustic practised by Monsieur Pasquier according to Ducamp. Having ascertained with a soft bougie the seat of the stricture, the caustic was applied, and on the third day following and the two succeeding ones, a wax bougie was passed down and beyond the stricture about an inch, and retained there for the space of an hour. Upwards of twenty applications of the caustic were made to the stricture, followed by the dilatation, until at length the bladder became irritable, and this treatment was discontinued: he now made water very freely and little or no pain, and a bougie à ventre of three and a quarter lines passed freely through the stricture. By the application of warm hip baths, opiates, and country air, the irritability of the bladder soon subsided, but a slight discharge from the urethra continued; a tolerable sized bougie was occasionally passed through the stricture, and the patient enjoyed a comfortable state of health for some years. April 1232. Although the occasional use of the bougie was persisted in, all the symptoms of stricture had again appeared; frequent desire to make water, voiding little at a time, and that with difficulty and in small quantity, urine turbid, and on standing deposited a quantity of mucus, constant discharge from the urethra, the testis painful to the touch, extending up the spermatic cord, and on exposure to cold the patient was threatened with a retention of urine, and which took place on the 22d of this month. Mr. Guthrie was now applied to, and introduced with little resistance from the stricture a small silver catheter into the bladder and drew off about fourteen ounces of limpid urine; the patient made water in small quantities during the night, attended with straining and considerable pain: the catheter was introduced every second or third day for some time and opiates given at night. In June following, he made water in a larger stream and less frequently, but the introduction of a large sized catheter or bougie caused a retention of urine, which was only overcome by passing a small catheter. The pains in the testes and spermatic cord still continued, and the discharge from the urethra and mucous deposit in the urine little diminished. The head now began to sympathize with the testes, the patient being seldom free of pain in the head and beating of the temporal arteries; leeches to the temples and cupping at the nape of the neck seemed to do harm and were discontinued. Calomel and opium, pil. hyd. et extract. conii, and various other remedies, were given with no better success. September 1833. The affection of the head and the painful sensation of the testes, although relieved, are still present; the patient makes water more freely and less frequently; the discharge from the urethra and mucous deposit in the urine nearly the same. The argentum nitratum has been several times applied with the view of taking off the irritability of the stricture without the least benefit; each application produced a retention of urine, which was only relieved by passing a small bougie down or through the stricture. January, 1834. In consequence of a retention of urine, caused by the passing of a metallic sound through the stricture, Mr. Guthrie introduced a small elastic catheter into the bladder and retained it there for some days, the patient making water through it. Warm hip baths ordered twice a day, and half a grain of the acetate of morphia at night, attention being paid to the state of the bowels. The flexible catheter was now withdrawn, and another of a larger size introduced, so as to prevent the urine from passing over the stricture: this treatment gave great relief. A hollow elastic bougie, which only passed an inch through the stricture, was now substituted for the gum catheter, the patient making water by the sides of it; the warm hip baths and opium continued. After this method had been pursued for some days a very perceptible benefit took place; the patient made water less frequently, the pains in the head and testes gradually diminished, and from having restless nights and loss of appetite, he had now some quiet nights and a relish for food. The bougies were gradually increased in size and occasionally withdrawn for an hour or more during the day, and then replaced; as the patient became easier and made water without pain, the bougies were only occasionally introduced. May, 1834. The pains in the testes and head have gone off; the patient can retain his urine all night, little or no deposit takes place on its standing, and during the day he makes water in a natural way; a slight discharge from the urethra continues; his general health, which suffered much during the last two years, is nearly restored, and he now can pass freely a hollow elastic bougie

(No. 9), and which he will continue to do every third day until the diameter of the canal is of its natural size; but being careful never to give rise to irritation, by trying to do more than the part will bear.

The argentum nitratum, used in this case for the removal of the great sensibility of the stricture, only rendered it more irritable, and the potassa fusa failed in a similar manner; but I by no means wish to imply by this, that both remedies do not occasionally remove and destroy an excess of sensibility in particular spots of the urethra in a very satisfactory manner.

Stricture in the female urethra is of rare occurrence, from the nature and single function of the part; and when it does take place, it is to be treated in a similar manner, and the method by dilatation usually suffices. The meatus externus sometimes becomes unusually sensible; a complaint which is best removed by the argentum nitratum, either in substance or in ointment, or by the cupri sulphas. Small tumours affecting the same part may be destroyed in a similar manner, or by the scissors; but females usually prefer the ligature, the recommendation of which is more acceptable.

In conclusion, let me beg you will never forget, that no one method of treatment will succeed in every instance, and that he is the best practitioner who can avail himself of, and duly apply, the various means with which he is acquainted to each particular case.

LECTURE XIII.

The prostatic part of the urethra is subject to irritation and inflammation in young persons, occasionally ending in abscess of the prostate gland; but these complaints are rarely idiopathic, and occur for the most part from the extension or metastasis of disease from the anterior portion of the urethra, and are generally curable. The diseases, on the contrary, which afflict elderly persons, usually originate in the gland, with little reference to the urethra generally, are by no means so well understood, and rarely admit of a cure being accomplished, although the symptoms and sufferings of the patient may be greatly relieved.

In young persons, the membrane lining the prostatic part of the urethra may be alone affected as a consequence of gonorrhœa, in which case it will be either from acute or chronic inflammation, and in both usually extending, in a greater or less degree, to the orifice, or even into the neck of the bladder itself. When the inflammation is acute, the patient is sensible of a great alteration of the symptoms; instead of a considerable discharge with little pain, and that little confined to the anterior part of the urethra, the discharge nearly ceases, or is greatly diminished in quantity; the pain is now referred to the perineum, and, as the patient expresses it, to the neck of the bladder. He complains of pain above the pubes, which is more or less permanent; of a constant uneasiness deep in the urinary passage, which is frequently augmented to an irresistible desire to make water, and which gives him great pain from the moment it passes from the bladder. The tenderness in the perineum is considerable, accompanied by a disagreeable sense of fulness, which prevents the patient sitting comfortably unless on a soft cushion; and there is an uneasiness and weight about the hips and left thigh, which causes great lassitude, and increases the anxiety of the patient, who feels otherwise ill, and has the usual symptoms of general irritation. The inflammation has, in this case, been suddenly extended to the prostatic part of the urethra, and should be subdued by general as well as local antiphlogistic means. If the person is young and plethoric, blood should be drawn from the arm: twelve or fourteen ounces taken away in this manner often give greater relief than any thing else; and if followed up by a hot bath at 100°, in which the patient should be kept until he nearly faints, will often alone effect a cure. If the attack is severe, cupping on the perineum and on the sacrum should be adopted; and leeches should be applied above the pubes, more particularly when pain is experienced in that situation. In fact, active depletion, and more particularly local depletion, always does the greatest good in these acute attacks of inflammation in young persons, whilst, in elderly individuals, when the symptoms are nearly as urgent, although the inflammation is not perhaps so acute, and more confined to the bladder, its efficacy is sometimes doubtful, the relief obtained being evanescent, the debility permanent. In these cases (and they are not rare) I believe the difference to be this: in the young person, the inflammatory action is not accompanied, or has not been preceded, by any change of structure, whilst in the elderly man, a change of structure has been slowly going on, upon which the inflammation has supervened. If the inflammation is temporarily arrested by the depletion, it almost immediately returns, as the cause which induced it continues to exist, and assists in its reproduction.

Opium, and particularly morphia, is a most valuable remedy after depletion: it allays irritation, and assists materially in the removal of the inflammation. The various preparations of it may be given internally, or they may be used per rectum, in the proportions I usually recommend, of twice the quantity ordered for a pill or draught, and which is to be injected in a small quantity of starch or gruel, not exceeding two, or at most three ounces. It must be repeated from time to time, so as to keep the irritation under command, and its constipating effects should be obviated by an occasional enema of hot water administered previously, and by small doses of castor oil, or some other gentle aperient medicine; for drastic purgatives are not useful in acute inflammation of the prostate, although active purgation is advantageous in chronic disease of this organ. The recumbent position should be observed, with the hips rather raised than otherwise. In young persons it will rarely be necessary to introduce a catheter, unless suppuration is about to take place, and there is a retention of urine, when it should always, under such circumstances, be a small and very flexible instrument, which is to be withdrawn immediately. A catheter is frequently allowed to remain in the bladder, when the inflammation is in a chronic state, with advantage; it is always injurious when the inflammation is acute; but is frequently useful when there is irritation without inflammation, if that peculiar state can be duly ascertained. The hot bath, used generally as well as locally, gives considerable relief; and the constitutional derangement, or the febrile symptoms, must be attended to in the usual manner; all food being withheld, and the drinks allowed being of the most bland and diluent nature.

When, from the continuance of the disease, the occurrence of rigors, and the increase of the febrile symptoms, the augmented sense of fulness and tension in the perineum, and the greater difficulty of making water, the formation of matter may be presumed; an examination per rectum will often give considerable information, in addition to the swelling which may be perceived externally. It is very desirable the abscess should neither break into the rectum nor into the urethra, nor that the matter should insinuate itself behind the bladder, nor indeed go anywhere except to the surface. The same precautions should be observed, and the same practice followed, as in abscess by the side of the rectum, by making an early puncture. If matter should not follow on the first day, it generally will on the second; and the straight sharp-pointed bistoury should be used for this purpose, and pressed on, from the perineum through its deep fascia, by the side of the urethra, and above the rectum, until the surgeon is assured that it has penetrated the swelling; the flow of matter from which will prove the fact, and the slight bleeding which will ensue must under such circumstances do good. An abscess which is opened in this way, or which opens of itself in this manner, usually heals with little difficulty. If it opens into the rectum it is always a serious matter, and it is by no means readily cured when it bursts into the urethra. If it passes behind the bladder death is often the result, after a very prolonged illness, of which I have seen some very unhappy examples.

Chronic abscess of the prostate, or rather an abscess the result of a lower or more chronic inflammation, is a much more frequent disease, occurring generally from forty to fifty, and even to near sixty years of age. It is usually the consequence of stricture, but is not always so; and is generally complicated with inflammation of the mucous membrane of the bladder, and ultimately with disease of the kidney, by which the patient is destroyed when the disease proves incurable.

One of my earliest friends was thirty years ago attacked with uneasiness in the back part of the urethra, a great desire to make water and pain on passing it, without any discharge, but with a sense of fulness in the perineum, of weight in the hips and loins, and the uneasiness was increased on evacuating the bowels. I attributed this to the irritation arisin from sitting continually with a lady to whom he was much attached, and whom, for the best of all possible reasons, he could not marry. This lasted three weeks, before it was removed by a strict antiphlogistic plan of treatment. He had another attack, at Lisbon, in 1809, which yielded in a similar manner; and he was quite aware of the difference between this disease and a common gonorrhœa, a disease he had contracted in the interval two or three times, and had been cured in the usual way, the last by commencing immediately with small doses of copaiba, and increasing the quantity until the cure was completed, after the manner that has been since recommended as new. In 1817 he had another attack which was more obstinate, but ultimately yielded to a similar treatment, with the addition of a mild course of mercury. After this he married, and remained well for several years, but unhappily became a widower, and some months afterwards had a return of his complaint without any very evident cause. All the usual remedies now failed, and his disease gradually increased. During three years, he consulted all the most eminent surgeons in London, and at last died, completely exhausted, under the care of Dr. Prout. On opening the body, I found the prostate almost an empty sac, having been the seat of several abscesses communicating with the urethra. The internal surface of the bladder was in a state of chronic inflammation, but without ulceration, although, from the pain at the extremity of the penis, and the amazing quantity of discharge, almost apparently of a purulent nature mixed with the urine, considerable ulceration was expected. The ureters were much enlarged, and the kidneys diseased, that of the left side particularly being enlarged, softened, and, on cutting into it, found nearly an empty lobulated bag.

When a stricture has been of long standing, and frequently impassable, accompanied by great straining, and occasionally even by retention of urine for hours, abscess in the prostate is of common occurrence; and the formation of matter is often accompanied by such well-marked paroxysms of fever, as to resemble and to be taken for ague. In some instances the fits became even regular for a time, and again irregular. I have in the museum several preparations showing this fact. In this particular one, in which the prostate seems to hang in rags, abscesses extended up between it and the back of the bladder and rectum; and would have killed the patient, if he had not been cut off by ulceration of the gall-bladder, through the irritation of a large gall-stone. The disease in this case was originally stricture, and the quantity of matter discharged at intervals, together with the particular uneasiness and tenderness of the prostate on examination per rectum, marked the disease, with which the bladder also sympathised.

The following case of a physician, a friend of mine, who has been under my care during the whole of his illness, drawn up by himself, is an instance I have always told him of abscess of the prostate; and, if I outlive him, I am to ascertain the fact.

"Feb. 15, 1830. — Nearly seven months ago, while riding on horseback in the country, I was surprised one morning to find that I had frequent calls to make water without any obvious cause; and that the contents of the bladder were expelled with force, as if I had been taking a strong diuretic. The urine, too, was of a wheyish colour, unlike the thin, colourless, transparent fluid I had been in the habit of passing in the forenoon. These symptoms continued upon me, and were attended in the course of a few days with ardor urinæ and pain in expelling the last drops, like a wringing tenesmus of the bladder, whenever, more especially, I mistook the call, and went to make water with only a small quantity in the bladder. During my whole life I have had a highly sensitive irritable urethra; and having, about ten days previously, been attempting to take oil of turpentine for ophthalmic inflammation, which I was quickly obliged to discontinue on account of the ardor urinæ that it induced, I attributed the symptoms to some remaining effects of that stimulus; and attempted to subdue them by warm-baths, camphor in large doses, hyoscyamus, &c. but without success. As I had once in my life, thirty years ago, suffered greatly from stricture, which was finally relieved by the perseverance of Sir E. Home with the caustic bougie, my friend Mr. Guthrie had little doubt of my symptoms being caused by some return of that affection; but a small-sized instrument passed readily, and the stream of urine has never been much diminished or obstructed. Ever since that time till very lately, I have been a miserable invalid, suffering at times the greatest distress from irritation, apparently in the urethra, and the spasmodic wringing tenesmus (bearing down) of the bladder above described; and I cannot satisfy myself or believe that any plan of treatment, whether the antiphlogistic, the antispasmodic, the alkaline, the alterative, or the stimulant (with copaiba, &c.), after the fairest trials, were ever of the smallest service to me. No matter what plan I followed, or however rigorously pursued, the quantum of distress was just the same, and the relapses or accessions and paroxysms, without any discoverable or even to be imagined cause, just as frequent.

For several months an instrument, on passing into the bladder — which has often been done to ascertain the state of the passage, and to sound for stone — always caused the greatest pain when it entered into and passed through the prostate portion of the urethra; and Mr. Charles Bell, on examining the prostate gland, thought he could distinguish a small pouch or abscess there, as far back as three months ago. Latterly however, at a subsequent examination, that gland appeared almost healthy and natural, yet the symptoms of distress and irritation were then greatly on the increase. The urine, from the day of the first discovery till very lately, had not once been natural; it was then of a wheyish colour; it became afterwards either albuminous or muco-purulent, frequently in a very high degree. The best appearance was like a mixture of honey and water, or rather of honey adulterated with wheaten flour to make it white; at other times, and then I always suffered greatly, it was actually purulent, like the sanious contents of an ill-conditioned abscess; at others, again, the last drops only were thick and white as cream, but it never was woolly or soapy. My state was that of a patient suffering more or less irritation at all times in the urinary passages, and never altogether free from tenesmus of the bladder, with an accession or relapse into great 'suffering and distress about every week or ten days, when there was always a great discharge of muco-purulent sediment. After these I generally obtained comparative ease; but I possessed no power over their recurrence, which, for several months, actually seemed to be regularly periodical, rather than to depend upon any causes of exposure to weather or excitement from exercise or fatigue; for the worst of them happened while nursing myself with the greatest care, under the most approved modes of treatment, and what I cannot account for, when I have been reposing in bed after the middle of the night, or earlier in the morning when indulging on my sofa. Even now, when my symptoms are so much mitigated, if there be the smallest tendency to relapse or irritation, it is between the hours of three and six in the morning that I feel the symptoms, in frequent calls to make water, with uneasiness in the urethra. At my worst times these were attended with distinct heavy throbbing, so severe that I could have often believed the bladder itself was in a state of suppuration. Such was my condition when, about three weeks ago, under the advice of Mr. C. Bell and Mr. Guthrie, I undertook to inject the bladder with warm water through an elastic gum catheter, which I had attempted repeatedly before with the silver instrument; but the prostate portion of the urethra would not bear the application. It gave immediate ease; and by perseverance with the same once, sometimes twice, in the day, the urine, in the course of a few days, actually became healthy, the bladder could retain, without pain, twelve, thirteen, or fourteen ounces of urine, and I became freed, as nearly as possible, from the symptoms and feelings of disease. The change was so rapid and extraordinary, so much beyond my expectations, and the failure of every other plan of treatment, however skilfully conceived, had been so remarkable, that I could scarcely bring myself to believe or understand how the simple injection of warm water could have wrought such a miracle. Its truth, however, I consider to be established from the fact, that whenever I perceive the smallest tendency to relapse, which, in the sensitive state of my urinary organs, I am sure to feel on exposure to fatigue, the inclemency of the weather, neglect of my bowels, or departure from the strictest regimen in my diet, the warm water then is my sheet anchor of safety, giving the same relief as it did on the first application.

"June 8th, 1834.—My last report was dated February, 1830, now more than four years ago, when I flattered myself I had almost obtained a cure by injecting the bladder with warm water; but this relief did not last, and I ultimately found this remedy as inefficacious as all the others I had tried. The Pareira brava, buchu, uva ursi, the parsley brixton, galls, &c. were all brought into play in their turn, and all seemed to give some relief at first; but in all the relief was transitory and fallacious: the best of them seemed to be of the pepper tribe, such as the cubebs and the capsicum; but these too have long been discontinued as useless, and given place to the steady use of opium, from which I have derived greater comfort, and been enabled to take exercise and enjoy life in a degree I never expected in this world. My dose is now, and has been for months past, a steady one of one grain morning and evening; and when attacked with irritation, I repeat it to as far as three or four times that amount if necessary, almost always with complete relief. I am not cured, and at my age (61) I never expect to be; but when I compare my situation now to what it was several years ago, I am most grateful for the improvement. The urine now is seldom muco-purulent; through the day it often, indeed generally, exhibits, more or less, flakes of albumen floating throughout the mass, and cannot otherwise in any way be called foul or unhealthy, except in the morning, when it is uniformly more loaded with mucous deposits, and less healthy in appearance than at any other time. It is then, too, just before getting up on first awakening that I have always more irritation and uneasiness than at any other time of the day; but at present I can throughout the day retain without distress, ten, twelve, and fourteen ounces of urine, and I am seldom disturbed more than once in the night to make water. I recollect nothing else worth mentioning, except that when I pass a catheter I feel uniformly excessive tenderness and pain as soon as the instrument enters the membranous portion of the urethra; and that there is generally, more especially in the morning, a slight discharge of ropy mucus at the orifice of the urethra, such as is perceived at the termination of the cure of gonorrhœa. For the encouragement of others similarly distressed, I ought also to add, that in all the former part of my life I considered opium to be a drug so inimical to my constitution, as to be inadmissible under any shape. It is now my sheet-anchor, and has proved as useful to my general health as it has been beneficial to my local disease." In the beginning of 1834 the urethra was scarcely pervious to a No. 3 catheter, which I passed with difficulty, in consequence of the return of the old stricture. This gentleman is now in good health and good condition, capable of enjoying himself at table with his friends, and will, I hope, long continue to do so.

Inflammation, followed by abscess of the prostate, is always accompanied by irritability of the neck of the bladder, and which is frequently propagated to the kidneys. This is best allayed by washing out the bladder with warm water, and by leaving in it a small quantity, containing from half a grain to a grain of the acetate of morphia. The soundness of the bladder is perhaps best shown by its capability of containing from eight to twelve ounces of urine at a time: but it is difficult to discriminate between that irritation of the neck of the bladder which arises from sympathy with disease of the kidney, and that which occurs from disease of the part itself; and it is more difficult at a later period to ascertain which was the primary disease. If there be stricture of the urethra, it should be gently dilated, and the irritation may be removed by the means I have pointed out; but the bougie, or dilating instrument, must not remain or be passed into the prostatic part, unless the patient cannot make his water, or the doing so is accompanied by more pain than the passing of the instrument, which should be the guide for our instruction. Few patients can bear a catheter in the bladder under these circumstances; and the occasional use of it must depend on the feelings of the patient as to the advantages derived from it.

A strumous habit has been supposed, by Sir Charles Bell, to render persons more liable to this complaint; but I have not observed that it does so, except in those persons who may suffer from it in early life. In the middle and later periods I do not think scrofula has any thing to do with it. When the matter of the abscess has been discharged, change of air, particularly to the sea side, quinine, sarsaparilla, galls, the turpentines and balsams, all in very small doses, so as to be scarcely diuretic, and always to act as it were imperceptibly, often do good; and the patient should preserve as much as possible the horizontal posture, avoiding all unnecessary excitement. The advantages to be derived from the steady use of opium are too clearly shown, in the preceding case, to be disregarded.

The prostatic part of the urethra and the neck of the bladder are often affected in middle-aged persons, and sometimes in young ones, by mere irritation or low inflammation, which gives rise in both to troublesome symptoms. In young persons it is more usually from the sequelæ of gonorrhœa; in elderly ones it more often arises from the irritation of the urine, which is secreted of an undue and irritating quality, depending on a faulty state of the stomach and bowels.

When it follows a gonorrhœa, or has existed for some time as a consequence of it, the cure is to be accomplished by strict attention to the general health, diet, and exercise, and by the use of the bougie. This is to be used only after an interval of three or four days, and should be a very soft one. It gives great pain on passing through the prostatic part of the urethra, and the point of the bougie comes out in all probability tinged with blood and matter. After two or three trials, a little purulent matter only is observable, and by a continuance of its use a cure is generally effected; but the patient is liable to a relapse, unless he is very careful to avoid all exciting causes of disease, and particularly that of intemperance. In some obstinate cases, where other means have failed, I have reaped advantage from the use of mild stimulating and sedative applications to the part affected, through the medium of a hollow bougie, in the manner I have already described. In every case of disease of the urethra, great advantage and comfort will be derived from fomenting the perineum twice a day with a large sponge which has been dipped in hot water, or by sitting for a few minutes in the hip-bath.

LECTURE XIV.

On the Chronic Enlargement of the Prostate Gland.

This disease is, as far as we know, produced by those changes which take place in the body in its natural progress to decay, being commonly observed to a greater or less extent in all elderly men. It occurs in some at a much earlier period than in others, does not appear to depend on any previous irregularities of life, or scarcely to be influenced by them; and as it does not take place, or has not been observed in the *corpus globosum* or prostate of the female, which is destitute of a secreting structure, this part may reasonably be supposed to be the texture in which the peculiar change takes place constituting the disease.

It was formerly presumed to be of a scirrhous or malignant nature, from the hardness which occasionally accompanied its formation; but as it has not been observed to communicate an influence of this kind to the neighbouring parts, or to any other analogous textures of the body, which usually suffer from malignant diseases, the idea has been abandoned. The only extension of a similar disease that I have observed has been of an apparently chronic suppuration, of a scrofulous character, of the nearest absorbent glands. I have seen this in only two instances, and the first occurred in an old man in Wardour Street. The prostate was larger than a closed hand, had partaken of a cheesy-like suppurative process of this kind, and the whole pelvis was nearly filled up by a mass of disease of a similar character.

In the more common kind of enlargement, the part is rather soft than hard, yielding a little to the touch, but is not elastic or springy, like a spongy tumour. The enlargement is sometimes but trifling, in which case the prostate retains its natural shape, and merely projects a little into and around the orifice of the bladder; but when it is considerable, as in very prolonged and neglected cases, it is often as large as a full-sized orange. One lateral half is usually much larger than the other, and protrudes into the bladder, giving rise to one or more projections, which cause great distress to the individual. The left side, I am led to believe, undergoes this change more frequently than the right, although no satisfactory reason can be given why it should be so; and whilst one projection is directly backwards and inwards, it sometimes is seen to form a second immediately behind the orifice of the bladder, and which is frequently supposed to be an enlargement of that part of the gland behind the entrance of the vasa deferentia, and which has been called by Sir E. Home the third lobe. Without denying that a third or middle lobe exists and is occasionally diseased and enlarged, constituting a projection of an apparently similar nature, I am of opinion that it is of more infrequent occurrence than has been supposed. That it is, in fact, not always the third lobe alone in a diseased state, but a continuation of the enlargement of the lateral lobe. In the lithograph drawing, p. 230, a disease of this kind is represented: the third lobe appears to be projecting in a very distinct manner into the bladder immediately behind the orifice of the urethra, and the enlarged left lateral lobe is also seen protruding into it, and forming a second projection by the side of the first. Dissection from behind, however, shows that these two projections are formed by the same part, *viz.* the left lateral lobe, and that the smaller pyriform one is not formed by a distinct third lobe.

I have said, page 21, that the lateral lobes are formed in the fœtus each in two parts, that between the fourth and fifth month the two internal parts unite, and the prostate is then composed of three parts, which between the sixth and the eighth month lose their separate form and become one substance. When the gland is in advanced life the subject of disease, I suspect these different formations may take it on separately, so as to render the parts again more distinct. For instance, the left lateral lobe in the lithograph drawing appears when whole and cleanly dissected from behind, to be one continuous lobe, but when cut into in the length of the projection, it seems to be formed of three glandular parts united by a peculiar cellular structure, so as to form apparently one body. The nipple-like process called the middle lobe is one, the connecting bank is another, and the lateral lobe is the third; whilst on the opposite or right side the second is not developed, so that four apparently distinct glandular parts are to be perceived with their connecting media.

I have also said, page 21, that the portion of the gland nearer to the bladder than the ejaculatory ducts, forms a sort of bar or connection between the two lateral portions, and this part sometimes takes on different forms, and is called the middle or third lobe. When the whole gland is diseased and enlarged to a great size, it appears distinctly behind the ejaculatory ducts, and to be more intimately connected with the left than the right lobe: to be, in fact, at the upper and outer part united with it, whilst it is not so with the right lobe, nor at the under part. The channel for the urine and for the catheter, is on this account perhaps situated to the right side, between the right lateral lobe and the nipple-like projection, rather than to the left; but this subject requires further and more minute investigation.

When the prostate becomes diseased, it does not descend and bulge so much into the rectum, as would be the case if the enlargement were equal in all directions; but it rather ascends and projects backwards and inwards, the bladder giving place to the enlargement rather than the rectum. The increase upwards of the prostate has also a particular effect upon the urethra, which is augmented in size with it, from its anterior to its posterior wall, and thus becomes a deep and narrow instead of a circular canal. This is shown in the drawing, p. 230, in a very distinct manner, and the size, and the quantity of urine which might lodge in it may be estimated, by supposing the two surfaces which have been slit open to be applied to each other. The letter *f* marks a hole made by the improper use of the catheter in the under part of the membranous part of the urethra. The letter *g* the commencement of another to the right side, and nearer to the prostate. The letter *e* several bruised spots at the neck of the bladder, and to the right side of the smaller projection. These were made by the point of the catheter on its being forcibly carried into the bladder. When the parts were removed from the dead body, and the man died the day after he was admitted into this hospital, the catheter could not be made to pass these spots without some force being used at the moment of depressing the handle of the instrument, the point of which went below the projecting central part of the prostate, into the deep sulcus formed below it, and between it and the floor of the urethra. When, on the contrary, the point of the catheter was made to glide along, and to raise the upper surface of the urethra, it slipped into the bladder with tolerable ease. I apprehend and hope that the contemplation of this drawing will not only demonstrate to the student the state of parts in such cases, but impress on his mind the course the catheter should take, or be made to take, in all similar cases, in order to enter into the bladder without doing mischief.

PLATE III, FIG. I.

a. The orifices of the ureters.
b. The left lateral lobe of the prostate.
c. The right lateral lobe.
d. The third lobe, or projection communicating with the left lateral lobe.
e. Several bruised spots caused by the catheter on entering the bladder.
f. A hole made by the point of the catheter in the under part of the membranous part of the urethra.
g. The commencement of another hole nearer to the prostate.
h. A line drawn across the entrance of the ureters.
i. A line drawn across the upper edge of the projections of the prostate into the bladder.

FIG. II.

A back view of the same preparation.

a. A line drawn across the entrance of the ureters.
b. A line drawn across the upper part of the projection of the prostate behind, showing the same distance between the parts as in the anterior view.

This drawing should be compared with that described page 33, in order to show the difference between the two diseases.

Plate 3

Fig. 1

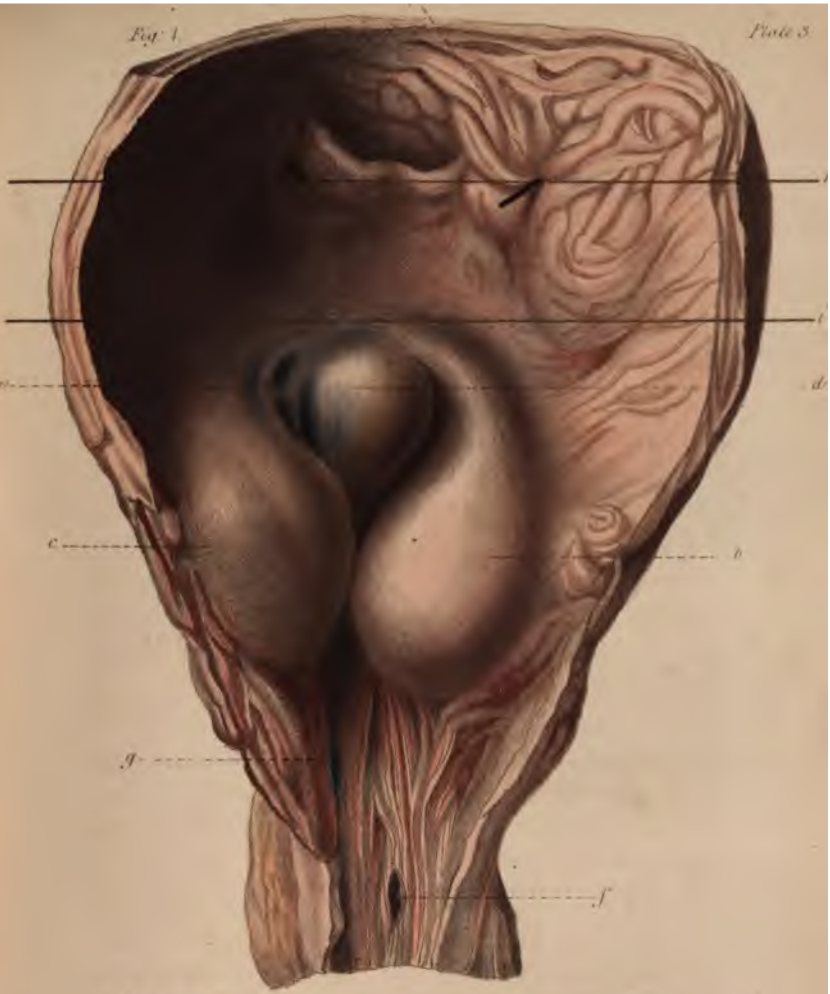
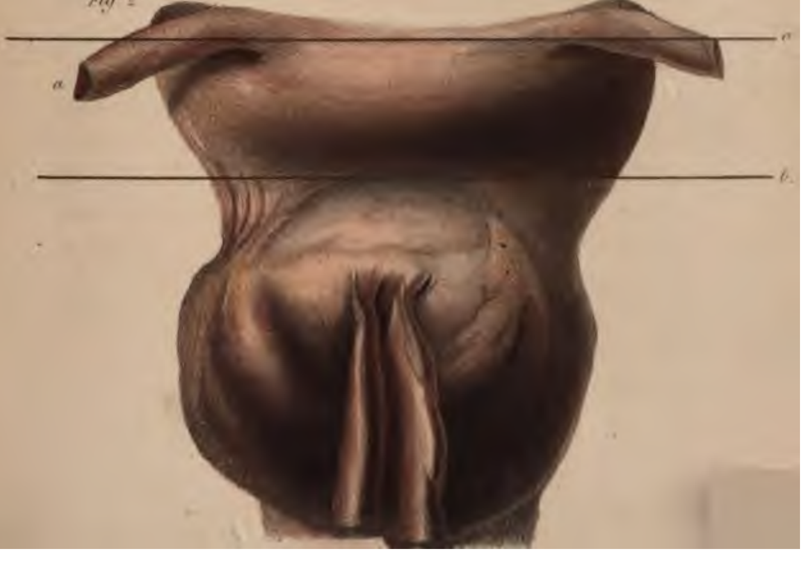


Fig. 2



When one side of the gland only is materially enlarged, it presses against the opposite side, and carries the urethra with it in a more or less oblique or tortuous direction, constituting one of the kind of cases in which an elastic gum catheter will pass very easily, without a stillet, when it will not do so with it, and is one in which a silver catheter should never be used. This state is generally discoverable by an examination per rectum.

The effect of these enlargements is first, to lengthen the urethra, so as to render a long catheter necessary; secondly, to deepen it, so that it may sometimes contain within the boundary of the prostate a small quantity of urine, which may run through the catheter before it enters the bladder, and thus deceive the inexperienced surgeon. It deepens the curve of the urethra from the apex of the prostate to the neck of the bladder, which may, and generally will form another obstacle to the passage of an instrument, whether it be from an enlargement of the third, or the lateral lobe, or from a valvular, membranous, or solid bar drawn across it by the very unequal enlargement of one lobe. Lastly it throws the channel to the right side in most cases, which should be recollected on passing the catheter into the neck of the bladder when any obstruction is felt.

The true chronic enlargement of the prostate is usually slow in its progress, and may attain to great size, and continue for many years without doing much mischief. When even it does become troublesome, it is rarely on account of the disease with which it is affected, but in consequence of that which it induces primarily in the bladder, and secondarily in the urinary organs. It is not curable although it is frequently very relievable, and if attended to in its early stages, its progress may in general be arrested. It is therefore of the greatest importance that elderly men should pay attention to the manner in which their urine is evacuated, and that they should cease to entertain the opinion, that a slowness and a difficulty in passing their water, are the necessary and irremediable consequences of an advanced period of life.

The symptoms of chronic enlargement of the prostate rendering the existence of such a complaint known to the patient, often come on suddenly. He usually awakes early in the morning with a strong desire to make water, and finds, on attempting to do so, that he can scarcely pass a drop, that no effort he can make is of the least use, although the urgency of desire is rapidly increasing and becoming unbearable. In this emergency he sends for a surgeon, who is nearly led at once to a knowledge of the complaint, by perceiving that the patient is an elderly man; and by ascertaining that he has not been subject to any disease of a similar kind, although he has been perhaps long aware of some difficulty, or of less freedom in passing his urine than formerly. On further inquiry it will generally be found, that some particular exposure to cold or wet, or that some irregularity in diet, or in exercise, has taken place the day before, of which the sudden stoppage and distress have been the result. The occurrence of a gonorrhœa in an elderly man has often led to the development of great irritability of the bladder and of this disease, and is a complaint which all elderly men should most studiously avoid the risk of contracting; and great sexual excitements are often eventually as detrimental, although they may not be so immediately dangerous.

If the enlargement of the prostate should be nearly confined to one lateral lobe, and is not accompanied by a projection behind the orifice of the bladder, the patient does not commonly suffer from so sudden a retention of urine, but is led to seek for assistance from the gradual increase of the inconvenience and difficulty he sustains in making water, from its being accompanied by pain in the glans penis and along the urethra, and from certain changes in the appearance of the urine, which convince him he is the subject of a disease more than is usually incidental to the common decay of nature.

In other cases the enlargement of the prostate is accompanied from the commencement by an incontinence of urine, and the patient is obliged to wear a bag in order keep himself tolerably comfortable.

An elderly gentleman was in the habit of consulting me from time to time when he came to town, from a distant county, for the last five years, and died lately at the age of 79. His complaint began by an incontinence of urine, accompanied by great desire to make water, which came in small quantities, and was expelled with very little force, so as to pass slowly in a small, broken stream. This was soon accompanied by a discharge of blood which tinged the urine, and occasionally by pain in the glans penis. On examination, I found he had a very enlarged prostate; yet a catheter passed with ease, and drew off a small quantity of water. The motions of it in the bladder were impeded, on any attempt to turn it to the left side; and I was satisfied he had a tumour extending into it in that direction, on which I rather thought ulceration had taken place, and from which the bleeding came. He was very unwilling to have an instrument passed, and submitted to it twice only with great reluctance; on neither occasion could I feel a stone, yet the impression on my mind was, that there was one lodged behind the projection into the bladder. But as he had made up his mind not to suffer any operation, and his general health did not warrant the recommendation of one, he was unwilling to have the existence of a stone clearly ascertained. When last in town, about a year ago, the whole front of his shirt was wetted through by bloody urine, in the course of from twenty to thirty minutes after he had put it on; whilst the desire to pass his water was also sometimes so great, that he could scarcely leave the urinal before he was obliged to return to it. Subjected to an attack of this kind one day in the street, when taking a short walk, he was obliged to go into a mews to relieve himself; but had no sooner attempted to leave it, than he was forced to return. This being repeated several times, attracted the attention of some vagabonds, to whom the old gentleman offered money to go away; but instead of doing this, they thought they could make more of him, and got the police to take him before a magistrate, charged with an indecent exposure of his person, and the magistrate very unwisely entertained the charge; so that he with great difficulty avoided a trial at the quarter sessions for an offence of which he was not in the slightest degree guilty. My certificate of his state put a stop to it. He died nine months afterwards. For two months previously to his death, his urine, which had always been bloody for years, became quite clear, and several pieces of a calculus came away, as if one had been broken in his bladder. At last, retention of urine came on, and a common catheter was passed without bringing away any urine, which only followed the introduction of the long silver one; and he gradually sank, exhausted by age as well as by disease. On examining the body, the bladder was found to be large; its walls thickened; the mucous membrane in a state of well-marked chronic inflammation, although free from ulceration in every part; the left lateral lobe made a very large projection into it, and behind the orifice, causing a deep hollow to be formed behind it, containing a large calculus, and several broken fragments, amounting in all to four ounces. The right ureter was more enlarged than the left, and contained in it a small calculus. The kidneys were very soft, friable, and enlarged, the central part being almost absorbed. The blood which passed for so many years was supposed to have come from one particular spot in the right kidney, perhaps where the first stone had formed. The parts having been forwarded to me from the country, I measured them as follows:— Circumference of the prostate, eight inches; length of the prostatic portion of the urethra two inches and three-quarters; length of the left lobe, including projection into the bladder, four inches; thickness of the prostate below the urethra, in the middle, three quarters of an inch; from the same spot upwards, an inch and a half. A catheter near four inches longer than is used in common cases of retention of urine was necessary, to reach the water contained in the bladder; and seven ounces were found in it after death, which did not run through when in the recumbent position, on account of the elevation the end of the instrument received from the great projection on which it rested. In this case the left lateral lobe seemed to form the whole of the projection into the bladder; but on a careful examination from behind, it was evident that the portion behind the ejaculatory ducts or the middle lobe had partaken in a similar manner of the disease, but was apparently only in connection with the left lateral lobe, and not with the right, leaving therefore the channel to the right side between this lobe and the projection, as in the greater number of instances. Dr. Prout was so good as to examine the calculi. The large one and the fragments were composed principally of lithic acid; the small one of phosphate of lime, with some carbonate enclosed in a thin membrane or bag, and was in all probability not deposited from the urine.

From the circumstance of the prostate gland being intimately connected with the neck of the bladder and the parts surrounding it, every increase in its size must make some change in, or drag upon the orifice of this viscus, and cause some alteration in the due exercise of its function. The loss of the natural elasticity of the part, and of the power of emptying the bladder, is the first perceptible effect, although it must I apprehend be preceded by a certain degree of low irritation which has led to a change, however slight it may be, of structure as well as of function. The bladder is not therefore duly emptied; and it is a fact no less remarkable than true, that if from one to two ounces of urine are left in the bladder, after the patient has exerted himself to empty it, the desire to make it again continues, or scarcely subsides before it returns as strongly as ever, and requires a similar and unavailing effort to expel it. So that after a dozen trials half as many ounces only will be evacuated; whilst if the first two ounces be drawn off and the bladder is completely emptied, the patient will perhaps sleep for six or seven hours quietly; and when he awakes make the six or eight ounces of water at once, which he could only have done at a dozen trials without such precaution having been taken. You have a remarkable instance of this in J. Madden, a patient in John's Ward. If he draws off his water at nine o'clock at night, he sometimes sleeps until four in the morning without much inconvenience. He does the same if he allows the gum catheter to remain in the bladder; but the pressure of the catheter on the orifice of the bladder seems to prevent irritation, and he says he is freer from uneasiness and desire when he has it in, than when he is without. It appears on trial that he can always empty the bladder of its contents, with the exception of an ounce to an ounce and a half; but if this small quantity is permitted to remain on his going to bed, he is obliged to try and make his water from a dozen to twenty times in the same period. The urine by remaining in the bladder appears to acquire some additional irritating quality, and the bladder from not being completely emptied never returns to a quiescent state, but always remains in that of irritation;

this in most cases soon becomes more or less permanent until it ends in a change of structure, and in all probability in the formation of an incurable disease. The first symptoms are thus accounted for; but there is soon, not only a desire to make water, but an inability to expel it in a full stream. It comes slowly and with little force, and at last dribbles from the orifice of the urethra, or is made by drops, or with frequent interruptions, until at last one of the irregularities I have alluded to, leads to a sudden and complete retention of urine. This may arise from an increase of irritation or inflammation of the mucous membrane of the bladder, but it more usually occurs from there being also the nipple-like projection and bank which are forced by the contraction of the bladder against its orifice, and thus act as a valve preventing the passage of urine through it. If the surgeon is well acquainted with the disease, there will be no delay in the use of the only remedy to be employed in such cases, *viz.* the catheter; and the probability is, that no evil will result from an attack which is thus promptly met and treated. If the case should be unhappily mistaken, and other means are employed, they only do harm by weakening the patient without bringing relief; with the exception of purging, which is often, in elderly persons, of great advantage after the bladder has been emptied, or in cases in which the retention is not complete. If the bladder is not relieved, or is relieved at too late a period, the patient sinks, and dies comatose; but before this takes place, he has suffered great pain. The bladder, in all cases of diseased prostate, is thickened, but is not always diminished in size; for when there is incontinence of urine from the beginning, the bladder is often enlarged and but moderately thickened. It is this thickening which renders a rupture of the bladder next to impossible, and causes the patient to die of a suppression of the secretion of urine in the manner I have already described when on that subject, with reference to strictures of the urethra, page 149.

When the enlargement of the prostate has made progress, so as to interfere with the free discharge of the urine, the internal or mucous membrane of the bladder is soon affected by low irritation, which becomes more or less acute, the urine appears a little turbid, and small threads or flocculi of fibrine are observed in it; shortly after a considerable muco-purulent deposit takes place, mixed with a glairy matter, both of which are indicative of the inflamed state of the membrane. The glairy matter was once supposed to be a particular secretion from the prostate; but as it takes place occasionally in females as well as males, it is now attributed to the mucous membrane of the bladder. Before the disease has reached this state, the urine usually becomes remarkably offensive, from a portion of it having been long retained in the bladder, it is of a dark colour, highly ammoniacal in odour, and proves to be alkaline on being submitted to a proper test. This alkaline property of the urine does not always depend on a vitiated secretion of the kidneys, which is a point of importance to recollect, inasmuch as that state of the kidney which leads to the secretion of alkaline urine is but little under the control of medicine or of art. In some instances the urine, partly free from deposit, will be slightly acid, whilst the deposit itself shall be alkaline; and if the bladder is emptied and washed out with warm water, and a little urine is afterwards collected, it will often be found to be acid; proving that it obtains its alkaline qualities from the secretions from the bladder, and not from the kidneys. Alkaline urine, from whatever source it comes, is always irritating to the neck or most sensible part of the bladder; and the reason why decided relief is often obtained from washing out the bladder once or twice a-day is thus shown. In this tenacious ropy mucus or glairy matter, which is often discharged in very great quantities, small portions of phosphate of lime are often deposited in white streaks, and which sometimes fall to the bottom of the vessel in which the urine is contained in the form of a white powder. In many cases aggregation from a similar cause takes place in the bladder, and the formation of one or more calculi is the result; so that the unhappy patient has first an enlargement of the prostate, then incontinence or retention of urine, and an irritable bladder, and lastly a stone pressing upon an irritable surface until perhaps ulceration ensues, and the patient dies, worn out by the most agonizing sufferings, or his death is accelerated by repeated, nay continual hemorrhages. In some cases many stones are formed in the bladder, of a small size, from the same cause; in others they descend from the kidneys, and cannot be expelled on account of the obstacle offered by the prostate. In such cases, however, the suffering from the stone is not so great as in many others; for the projecting prostate wards it off from the more sensible neck of the bladder, and the marked symptoms of stone are not always present: neither when there is a great projection, can a stone always be detected. The straining to expel the urine, and which is often very great, frequently gives rise to the formation of pouches in the manner I have mentioned in page 27, which greatly add to the evils already endured, and more imperatively demand the use of the catheter.

Retention of urine may also occur in this disease, in consequence of debility of the bladder from over-distension, as well as from a positive obstruction to its discharge. When a healthy bladder is over-dilated, the detrusor muscle loses its power, and the urine cannot be discharged by the patient, although no obstacle exists to its evacuation. An injury to the spine gives rise to the same result. The same thing occurs sometimes in fever, in hysterical women, and when the prostate is diseased, provided the coats of the bladder admit of dilatation, which they rarely do, unless at the commencement of the complaint. There is often, in these cases, a stillicidium urinæ which may deceive, as it continues although the bladder is gradually distending, and may be felt in persons not very corpulent, rising as high as the navel. In some instances, pressure on the abdomen causes the urine to flow in a stream, but this is not a desirable result, as it is indicative of a state of great danger. In all these cases, the bladder should be immediately relieved by the catheter, and the succeeding treatment will be a matter for consideration. When the distension arises from accident, or in cases in which the kidneys are supposed to be free from disease, the catheter may be used freely. Where the kidneys are diseased, and the albuminous, perhaps even purulent nature of the urine will show it, the return of the bladder to its natural dimensions should be more slowly effected by using the catheter at longer intervals, or, if more frequently, by not completely emptying the bladder on every occasion; or by injecting into it a certain quantity of warm water instead, which is by much the best way of proceeding, and which may also contain from half a grain to a grain of acetate of morphia; but if the kidneys are much diseased, the relief will be only temporary, and the patient will gradually sink and die.

In hysterical women the bladder should always be relieved at first; and if the patient is taught how to use the catheter, she will frequently, from the confidence she feels in having assistance at hand, do without. I have two ladies now under my care, who can neither swallow on some days, nor make water on others, and especially when the wind is easterly. I have been however particularly careful not to use an instrument either to the throat or to the urethra, but once when the bladder was greatly dilated; and I have little doubt of their recovery from both evils, by medical treatment only.

Hemorrhage from the prostate, which may arise from injury by the catheter, from ulceration, or from the rupture of some vessel accidentally, can only be treated by internal means; and those are preferable which are most successful in chronic or passive hemorrhage; such as opium and galls, or Ruspini's styptic, to which I have already alluded; or the subacetate of lead with opium in large doses, such as from one to two grains of the former to one of the latter every six hours; or the infusion of roses, with sulphuric acid and sulphate of alumen, as administered in the case of hemorrhage noticed p. 141. When the patient is plethoric, or the general state indicates rather an active than a passive hemorrhage, these remedies should be preceded by general as well as local bleeding; and the application of ice to the pubes, and even by injections of cold or iced water into the rectum, which often afford great relief in other cases of vesical and prostatic irritation. A catheter should not be used, if it can be avoided, during the bleeding; but if the irritation and straining render it necessary, the instrument should be allowed to remain, as the part must be kept in a state of rest. For if it be found that the action of the bladder reproduces or continues the hemorrhage, the quietude obtained by the catheter must be advantageous. If the bladder should be filled by coagulum, it must be dissolved, and washed out in the manner mentioned p. 139.

When ulceration of the prostate takes place, whether it be from abscess or from other disease, it may be suspected, from the peculiar stinging pain felt on the commencement and at the termination of the passage of the urine over the ulcerated surface, and from the pain in the upper part of the glans penis. In such cases the elastic catheter should be constantly worn; for the relief obtained by preventing the urine passing over the ulcer is often very great, although sometimes the pressure of the instrument is more wearying, and the patient submits to the acute pain as the least of two evils. Opium by injection into the rectum, or by way of suppository, often affords some relief; but the delivery of a suppository into the rectum in an efficient manner requires the aid of a small bone or ivory tube for the purpose, into the end of which it should be placed, and from which it may be driven out by a properly-fitted piston. This relief is often, however, denied to the patient; the irritation in the adjacent parts has extended to the rectum; internal piles are produced as well as external ones, and become so tender as not to allow the smallest pressure. They bleed on the slightest touch; and whilst they render the patient miserable on every attempt to evacuate the bowels, they give rise, with the enlargement of the prostate, to a sense of uneasiness and desire to do so, which is almost as distressing as the actual pain itself. The injection of cold water has in these cases often afforded great relief.

When retention of urine occurs from enlargement of the prostate, I have already said the first thing to be done is to pass a prostate catheter, and draw off the water, which gives great relief to the bladder, and, by allaying irritation in it, removes a very exciting cause of disease; but the immediate cause giving rise to the sudden attack, and which is in all probability an increased flow of blood to the part from the irregularities alluded to, remains, and will be best removed by the abstraction of a few ounces of blood from each side of the sacrum, by purgatives, and by rest in the horizontal position, or with the hips a little raised. The capability of making water does not, however, so easily return, although the secretion of it is increased, and the catheter must be again passed from time to time, say every six or eight hours as the irritation returns; or it must be left in the bladder. The best general rule, after the first two or three days, will perhaps be to withdraw the catheter, and repass it occasionally, provided it is easily introduced; but if this is effected with difficulty, it will then be more advantageous to secure it in the bladder, and to allow the water to flow through it at proper intervals. I am disposed to recommend its being allowed to remain for the first few days, because the quantity of urine secreted is always greater after a retention than before it; and that when the bladder is very irritable, it retains even half an ounce of urine with great repugnance, so that it may be necessary to allow it almost to dribble through, before the bladder can be tranquillized. In other cases the catheter proves very irritating, and must be withdrawn; but this is only shown on trial, and experiment must in a great measure regulate the practice. The efficacy of the permanent catheter is best shown in a case in which there has been great difficulty in passing it; for it will be found at the end of three or four days, that in all probability another of the same size may be introduced without difficulty: it has by its pressure during this time levelled the road, if it has not entirely removed all immediate obstruction. At the end of three or four weeks, the patient begins to be able to empty his bladder by his own efforts, and great relief is obtained; indeed the complaint is often apparently cured by the continued application of the instrument for eight or ten weeks more. The patient should afterwards continue to use his catheter from time to time, in order to prevent a return of the complaint, and to be sure that he can completely or nearly empty his bladder. Whenever he passes a catheter, which he should be taught to do, he may also wash out the bladder with warm water, by which means any slight irritation will be removed.

Some years ago I was called to a tradesman by his friends merely for the sake of form, as they said they were satisfied nothing could be done. I found him almost comatose from retention of urine, caused by an enlarged prostate. A catheter was introduced with some difficulty, and retained for a few days, when it was exchanged for a flexible metallic one. Soon after the urine was drawn off he recovered considerably; and at the end of twelve weeks he could dispense with the instrument, and nearly empty his bladder. A few months afterwards I operated upon him for cataract, and restored him to sight: he remained well for two years, and at last died of inflammation of the chest. In several other cases the success has been equal; and I therefore strongly recommend that the catheter should be permanently used in all cases in which it can be borne with ease.

A difference of opinion is entertained as to the nature of the instrument to be employed, some surgeons relying principally on the silver, others on the elastic gum catheter. I have pointed out the manner of using the silver catheter, p. 63, to which I shall refer you. The question is not now, however, which is the best, where both will pass, but of what is to be done when the gum elastic one cannot be carried into the bladder. Those who prefer this instrument for general use, admit that the case does occur; and then they suggest the utility of the silver one for the purpose of perforating the opposing obstacle formed by the prostate — that is, of forcing it through the prostate into the bladder, and in this manner drawing off the water. I have seen several cases in which this has been done; and although in some the patients have died, in others they have lived for a long time afterwards, apparently without having suffered any particular evil from the injury inflicted on the prostate, that is, they did not appear to get worse. I have already said I have seen the prostate perforated in several places; for although when once the catheter is introduced through it the urine flows readily, still it must be removed every six or eight days to be cleaned; and it does not follow that the point will again hit the same hole. I am of opinion, that the prostate should not be wilfully perforated, although it may be done accidentally; and that, by using the silver catheter in the manner directed, it will usually go into the bladder without such an accident taking place. It requires often, however, a certain degree of force, and in the hands of an inexperienced person, the prostate may be perforated, when the patient is for the time saved.

If a gum elastic catheter is preferred, and it is the safest instrument for the young surgeon, it should be longer than usual, and a No. 12 in size, if the urethra will readily admit of it, with a flattish round point, and curved in the manner shown, page 71, fig. 4, but never in the slightest degree pointed. If kept on an iron stillet with a large curvature, as recommended by Sir E. Home and Mr. Brodie, it keeps its shape tolerably well after the stillet has been withdrawn until it gets warm in the urethra, when it must be exchanged for another. With the stillet it can work in the same way as the silver catheter, and the directions for the one will answer for the other, but without the stillet it admits of various manipulations. The urethræ of some persons possess so peculiar an irritability that they cannot admit a silver instrument without great uneasiness, when a soft plaster or elastic one will pass with ease. An old friend of mine, a surgeon in the army, is subject to stricture at the bulb of the urethra, and can pass a No. 12 soft bougie with impunity; but if he tries a silver or a steel one of the same size, it always gives him great pain, and brings on spasm of the surrounding muscular structure, which forces him to desist. In such cases an elastic instrument only should be tried, but it should be so firm, and keep its curvature so well at the point as to obey the motions of the handle. It should be held lightly between the finger and thumb, and slowly but steadily insinuated along the urethra as far as it will go, by which time the handle will form nearly a right angle with the pubes, when the handle is to be depressed or brought down between the legs, in order to enable the point to ride over the obstacle at the very orifice of the bladder. If this fails, the surgeon should recollect that the channel is usually to the right side, and if the point of the instrument is round and smooth, it may be made or induced, if held loosely, to take that direction into the bladder. Sir E. Home thought that this object was more easily obtained by holding the handle of the catheter towards the groin on first introducing it, but as he afterwards directs that the instrument is to be brought to the perpendicular line, and depressed when it is nearly upright, I do not perceive any advantage that can be derived from the position of the instrument to one side, except as far as relates to the greater facility with which the commencement of the introduction may be accomplished. The object of giving the point an inclination to the right, after the instrument has been placed in the perpendicular direction, or the handle has been brought to a right angle with the pubes, can only be effected I apprehend by certain motions communicated to the handle after that period, as its depression takes place. It is one of the various manipulations alluded to, and which are only learned by practice. When the point of the elastic catheter has reached the base of the enlarged prostate, the point may be made to mount more easily by withdrawing the curved stillet for about an inch, which causes the point to be turned upwards with a different curvature from that which is communicated by depressing the handle. Pressure on the urethra in the perineum effects a similar object, and when the fore-finger is introduced into the rectum it may be made to bear on the extremity, or to become a fulcrum in the centre of the curve, on which by pressure on the handle of the catheter it is made to act as a lever at its point. In these manipulations the stillet must be withdrawn. Lastly, when every attempt has failed and experience teaches many different ones, and there has been time to make the trial, without the risk of serious mischief; I have succeeded, by introducing a gum catheter into the urethra of a size to pass easily, and with a round point, as far as it would go, and then leaving it there properly secured, with a portion projecting for two or three inches beyond its extremity. In many instances it has softened during the night, and taken the course of the canal into the bladder.

Careful observation alone gives the necessary tact in these cases, and an opportunity of acquiring practical information should never be neglected.

If an instrument cannot be passed, or cannot be made to perforate the gland by force in the manner alluded to, the patient must die, unless the bladder be punctured above the pubes or some other operation is done for his relief. If the bladder be punctured above the pubes, the patient must, in all probability, be content for the remainder of his life to make his water through the catheter, which is to be introduced into the bladder by the wound, even if the operation succeeds in saving his life for the moment. This operation is to be done by making an incision in the central line two inches long, from over the edge of the pubes upwards, as in the high operation for the stone. The muscular wall is then to be divided close to the bone, which may be done by a trocar bistoury which is made for the purpose, or by a straight sharp bistoury in the beginning, followed by one with a blunt extremity, so that the fore-finger may, when introduced through the opening, feel the distended bladder rising up towards the umbilicus. If the bladder is so small that it cannot be felt in this situation, this operation ought not to be done; for the peritoneum will not be carried high enough up on its anterior surface, to leave a space below it in which the trocar may be pushed without fear of its penetrating above the peritoneum, and thus entering the cavity of the abdomen instead of that of the pelvis. The bladder being however duly distended, the trocar is to be pushed in downwards and backwards, with due attention to the axis of the pelvis, and the trocar and canula should both be long, so that the canula may be well introduced after the bladder has been duly punctured, and its escape in this way prevented when the bladder collapses or contracts upon it. A round-pointed flexible elastic catheter should be carried into the bladder through the canula, and when this silver instrument is supposed to cause irritation, it may be withdrawn over the catheter. If it is done in the first instance, the hole in the bladder will be larger than the catheter, and if the patient turns in bed, some urine may escape by the side of it and do great mischief. This will be however, I think, prevented by keeping the plug or stopper out of the catheter when the patient sleeps, and by having a long external bladder attached to receive the urine which trickles from it.

A question has arisen in my mind, whether any operation could be done on the prostate from the perineum; and I was led to entertain it from finding that in a patient on whom I had operated for stone, whose prostate gland was much enlarged, I had rendered him a further service in the diminution of the prostate; so that instead of making his water with difficulty, he afterwards made it easily, and the catheter passed with facility, instead of meeting with a considerable obstacle at the neck of the bladder. In fact, I was satisfied I had cured or nearly so the disease of the left lobe of the prostate, which I found to be much enlarged during the operation. The success which ensued in this case, made me think the proceeding deserved further consideration, and I inquired of several of my surgical friends whether they had met with any thing of the kind. At that time none could speak affirmatively, with the exception of Sir William Blizard, who lent me an unpublished paper on the diseases of the prostrate gland, which had been read at the Medical and Chirurgical Society in 1806, from which I have extracted the following observations and case.

" It is my design at present to notice only that state of induration, which is maintained by confined purulent matter, and which from its peculiarities in the part, may approach in degree nearly to that of scirrhus. It is well known that among the varieties in the process of suppuration, there is a slow operation under which this great hardness in the parts surrounding the seat of the matter arises.

" When the inflammatory action ceases, the purulent matter may remain confined by the firm investment of the prostate gland for a length of time, according to various circumstances. During this period, it undergoes a change, determined by the powers of absorption, and by its own tendency to decomposition, and may acquire a consistency and colour very different from what recently secreted pus presents.

" If the parietes of the spot thus containing matter, be amply divided and the matter discharged, the hardness, and, if it be a circumscribed body such as a gland, the bulk also of the part will lessen to a considerable degree, although it will not be entirely reduced, and the wound will heal in a kindly manner. But the process of induration may commence and continue, without terminating in the formation of matter, in which case also an incision by inducing suppuration will generally lead to a favourable result.

"A man about seventy years of age was admitted into the London Hospital on account of retention of urine, attended by great pain in the vesical region. Upon examination, the prostate gland was found to be considerably enlarged, and projecting into the rectum: It could also be plainly ascertained by the catheter to have protruded into the bladder, and what is to be particularly observed, the sensation of hardness felt through the medium of the rectum was very considerable. The retention of urine was obviated by the use of the catheter, which was passed not without difficulty, and he thus obtained relief for near three weeks, when he gradually sunk. Upon examination, the prostate gland was found to be much enlarged and indurated, but not in a scirrhous state, and clearly in a condition which might have been considered as alterable. The central part of each lateral lobe was become a follicle full of pus, and the enlargement and extension towards the rectum and bladder were considerable.

"I am disposed to think this person might have been successfully treated by dividing the prostate by a double gorget cutting on both sides, introduced in the usual way on a staff into the bladder. It would have removed the immediate distress, and might have laid the foundation for a cure. This is not a speculative remark. I have several times performed such an operation in cases of disease of the prostate gland, which I have thought within its scope of relief, with complete success."

The principal objections to any operations by incision on the prostate gland, arise from the age at which the patient has usually arrived, from the corpulency with which many of them are afflicted, from the great depth of the perineum in such cases, and from the state of the constitution, which is generally much impaired from previous suffering. It is known, however, on the contrary, that old men bear the operation for the stone very well, which is much more severe than any operation for the division of the prostate need be, and cases may occur of men with good constitutions, in whom the palliative mode of treatment may not be sufficient to render life less of a burthen, and who may be willing to try the doubtful remedy by incision. Melius anceps remedium quam nullum.

LECTURE XV.

On the Chronic Thickening of the Neck of the Bladder.

The lithograph drawing, which is placed opposite page 33, represents a remarkable case of chronic thickening of the neck of the bladder, which was presumed to depend upon an enlargement of the middle lobe of the prostate gland. It is however quite conclusive that no such disease existed, and that a peculiar affection of the neck of the bladder, and which I have supposed to be situated principally in its elastic structure, gave rise to all the symptoms, and ultimately to the death of the individual. For the observations I have made on the muscular and elastic structures of the neck of the bladder, I must refer to the commencement of the work, on its anatomy, from page 14 to 34.

This disease may commence at an early period of life, and can then be kept at bay by the periodical introduction of the catheter, but as long as this source of disease remains, the patient is never safe. It slumbers on like a smothered fire, ready at some future time, when the patient is more advanced in life, or on the application of an additional exciting cause, to burst forth with renewed vigour, and to lead to his destruction by the production of disease in the neighbouring parts. Fortunately it is, like the chronic enlargement of the prostate, more commonly the disease of an advanced period of life, and is usually as insidious in its commencement and progress. The patient is aware of there being something the matter with him, but he knows not what; he finds he has a more frequent desire to make water than formerly, particularly at night; that it does not flow so readily nor so freely as it had usually done; and that he is most free from irritation whilst his mind is particularly occupied, and especially after dinner, when he can often refrain from attempting to make water for four or five hours. On this account the complaint is frequently attributed to nervousness, or to derangement of stomach, giving rise to a vitiated or faulty secretion of urine, and the patient is subjected to an internal treatment alone, which, however excellent and necessary it may be, should always be auxiliary to the local management, without which I do not think the disease can be arrested, much more completely overcome.

At this period the elasticity of the neck of the bladder is impaired, it will not dilate with the ordinary action of the detrusor muscle, and this is therefore augmented. A sensibly-increased delay is experienced before the water begins to flow, and the patient is conscious of the augmented effort made by the bladder; in other words, he is obliged to strain to expel it. The desire in which this originates soon amounts to uneasiness, and rapidly afterwards to pain, relieved on evacuating a little water, but too soon, alas! to return; for the bladder is now never completely emptied, and the urine which remains is a source of great irritation, although the quantity is really inconsiderable. I have considered the disease as being hitherto confined to the very neck of the bladder, and yet it is hardly possible to account for all the symptoms, without supposing the whole of the elastic and muscular structures entering into the composition of the triangular space immediately behind the orifice of the bladder to be in some degree affected, as well as the mucous membrane which covers it. These structures do not perform their functions effectively of expelling the last drops of water, whilst the under part of the orifice, by its greater firmness and loss of elasticity, presents the commencement of a bar or dam over which the last quantity of urine is not projected, when the fundus of the bladder ceases to act; for I am not satisfied that the muscular coats of the bladder contract so as to completely, although temporarily obliterate its cavity. The desire and the pain are felt because the membrane of the bladder is irritable, and particularly that most sensible part of it, below and around its orifice. The urine in the commencement is clear, afterwards it becomes a little turbid, small shreds of mucus or of fibrine are seen floating in it, soon to be followed by a deposit of the same character, which becomes in turn glairy, viscid, and even resembling pus. At first it is acid, and continues so until this deposit takes place in quantity, when the whole on standing may be alkaline, as in the enlargement of the prostate, although the newly-secreted urine is acid. In the commencement of the complaint the urine is not albuminous, but after a time it may become so; the addition of a little nitric acid renders it turbid, and on heating the urine, in a test glass over the candle, the albumen is coagulated, and if it exists in quantity, a thick cloud is perceivable in it, and which will be slowly deposited. A small quantity of albumen will be found as a consequence of inflammation of the bladder, a larger quantity is usually indicative of the inflammation being extended to the kidneys. The alkaline property is obtained from the mucous secretion of the inflamed bladder; and if a portion of acid urine can be obtained after washing out the bladder, it shows that the kidneys are not so especially implicated as when they uniformly secrete urine of an alkaline quality. When the disease is principally confined to the bladder, the supernatant urine will generally be acid, although the viscid mucus below is highly alkaline, turning the turmeric paper brown, or the red litmus paper blue.

The very frequent efforts made to discharge the urine, and which can only be expelled by a considerable effort made by the muscular structure of the bladder, lead to the formation of pouches in the manner I have already explained, and render the case more complicated and difficult of management, inasmuch as the catheter does not give the expected and necessary relief; it empties the general cavity, but not the pouches, except their particular situation can be ascertained, and the instrument guided into them, which can rarely be done. The instant the person changes his position, the contents of a pouch is poured into the general cavity, and on a second change taking place, that of another, and the desire to make water is renewed; so that to be effective the catheter must be worn until all the changes of position which appear to influence the flow of water into the bladder have been gone through. The advantage to be derived from wearing a catheter for the first half hour on retiring to bed is thus obvious, and must be attended to, or the use of the instrument will be quite unavailing. When the catheter is passed, and the urine in the general cavity is drawn off, the pouches fall down upon the instrument, and give rise to those sensations I have called (page 31) the fluttering strokes of the bladder; and if a calculus should have passed through the narrow opening of the pouch, the sensation or blow caused by a stone may be perfectly simulated and give rise to considerable error. A great weight in these cases is felt in the perineum and rectum, and the uneasiness is constant and often peculiar. It extends also along the penis, although pain is not usually felt at the extremity of it, and a few drops of urine occasionally escape involuntarily. Under these circumstances the disease may remain for a considerable length of time, until at last, from some sudden exposure to cold or wet, the symptoms are greatly augmented, and it becomes evident that a more acute inflammation of the bladder has taken place.

Acute idiopathic inflammation of the bladder is a disease of rare occurrence, and is to be subdued whenever it does take place by the usual antiphlogistic means. Acute inflammation, as a continuation or metastasis of disease, is more frequent; and, as a supervention on a chronic state of irritation, is unfortunately by no means uncommon. When it occurs by extension of disease from the urethra, the desire to make water is urgent; and the pain which accompanies it is so much augmented on the passing of a few drops, that the patient often compares it to the passing of melted lead. It continues after the urine has ceased to flow, and subsides only to be renewed almost without an interval of ease. It is not only felt in the urethra and along its whole course; but as the peculiar pain in this part subsides, it is referred to the lower part of the abdomen immediately above the pubes, where it is increased on pressure, and shoots into the perineum and down the thighs. The urine is discharged in very small portions, generally of a deep-red or high colour, although the aggregate amount in twenty-four hours may equal the usual quantity, unless the kidneys are also implicated.

The common symptoms of inflammatory fever are present: the pulse is usually full and frequent, the skin hot and dry, the thirst great, the tongue foul, with general restlessness, uneasiness, and anxiety; which are much augmented by the absence of rest, and the continued desire to make water. Sometimes in the first instance there is complete retention of urine; and if the inflammation should extend along the ureters, there may even be a suppression of the secretion also; but this is of very rare occurrence. When the complaint has arisen from violence offered to the urethra, by the forcible introduction of an instrument, or from the extension of the inflammation of a gonorrhœa, there is more or less of discharge from the urethra, which rapidly increases and is beneficial; for the symptoms of inflammation of the bladder do not subside until the purulent discharge from the urethra is fully re-established. The first symptoms should always be met by the abstraction of blood from the arm, by cupping on the sides of the sacrum and on the perineum, or by the application of leeches in relays, and these means should be repeated until the pain diminishes and the irritation subsides. It is of the greatest importance to subdue the inflammation quickly, in order to prevent the supervention of a chronic stage, which may lay the foundation for much future distress. The thirst should be assuaged by cooling mucilaginous drinks, and the bowels opened in the first instance by an enema and by calomel and colocynth, followed by a dose of oleum ricini; but the bowels should not be irritated, as any unnecessary action aggravates the uneasiness felt in the bladder and rectum, which, after the due evacuation of the bowels, should be soothed by the introduction of a suppository of opium. The internal medicines should be those which are found particularly useful in other inflammatory affections; such as a pill composed of half a grain or a grain of the submuriate of mercury with two grains of James's powder, and one third or half a grain of opium, every six hours; followed by a saline draught with an excess of soda, and from thirty to forty minims of the vinum radicis colchici, which also exerts a powerful influence upon the inflammatory action of these parts, but which, as well as the calomel, must not be allowed to act too much on the bowels. These remedies should be administered without reference to any thing but the patient's strength, and the violence of the inflammation; and should only be discontinued when their due effect is produced or the inflammation is overcome. The hip-bath, and hot water contained in a bladder one-third filled, will often also give great relief. As the inflammation subsides, the desire to make water and the pain which accompanies it diminish, the urine, which was at first of a deep-red colour and highly acid, becomes turbid, and deposits a sediment very much resembling pus, as well as those pink amorphous or lateritious deposits indicating the pre-existence of inflammatory action.

If the acute inflammation is not vigorously treated, it will not be entirely removed, but subside into a chronic state; and the same result often takes place as a consequence of those changes to which I have already alluded in the prostate gland and the neck of the bladder, as well as from the presence of a stone, or of an old and narrow stricture of the urethra, or from accidents to which it may be exposed. When irritation has been once set up in the neck of the bladder, gouty persons especially are liable to frequent returns of it, simulating an acute attack. But these cases should be distinguished from acute idiopathic inflammation, or those which occur from violence or metastasis: they are almost purely gouty, and are best remedied by colchicum, with the various preparations of opium, and but little by either general or local blood-letting.

Chronic inflammation of the bladder in various states and stages is however the most important, although the secondary disease, in all these cases; and the great object of inquiry is, how to obviate it whilst the primary cause or disease remains — an object towards the attainment of which I fear little has been or is soon likely to be done. In chronic inflammation, the inner membrane of the bladder, which is usually of a pale colour, becomes of a dark-red; its small vessels, which carried but little blood, now become distended with it; and particular spots are seen of a darker colour, almost amounting to black, in various places. The mucous membrane, which in its natural state is but loosely attached to the internal muscular layer, is evidently thickened and softer, and perhaps roughened; sometimes it is abraded, particularly around the darker patches; and in some rare cases has been entirely removed, so as to leave the muscular fibres exposed. It has even been said by authors to have been found in a gangrenous state. The great evil does not rest here. Sooner or later the muscular coat is implicated, in one or more of the various ways I have pointed out; the chronic inflammation extends upwards along the ureters, generally however affecting one more than the other, and at last giving rise to a similar chronic disease in the kidney, which increases the mischief, and often leads to the destruction of the patient. It is found that disease of the kidney can equally give rise to irritation and chronic inflammation of the bladder, although this appears to occur rather from sympathy than from the extension of chronic inflammation downwards; and a state of irritable bladder is thus induced, which can only be relieved by remedies directed to the removal of the derangement of the kidney; whilst from inattention to this point, the irritable state of the bladder may become a permanent disease, each reacting on the other.

When the irritation and pain in the bladder are symptomatic, the urine is often natural, and simply increased in quantity, although sometimes vitiated in quality, as discoverable by chemical examination, but contains little or no mucus. When the urine is natural in quality or quantity, or nearly so, but does contain mucus, and in considerable quantity, there is certainly chronic inflammation of the mucous membrane of the bladder. When the urine is acid, and otherwise natural in appearance, and contains purulent matter or blood with little mucus, the kidney is for the most part affected, and symptoms of that affection will prevail. But in cases of this description the bladder should always be carefully examined, in order to detect, if possible, the presence of any calculous matter. When the urine contains much, or is loaded with mucus, the bladder is certainly affected, and the deposit will be alkaline, although the supernatant part will often be acid; but if the urine be generally alkaline and unnatural, the disease may be attributed to the kidneys, and often depending on the habit generally as a constitutional disease. Alkaline urine is highly irritating to the bladder, and invariably gives rise to mischief if it long continues so; hence the caution necessary to be observed in the administration of alkaline remedies, and particularly of soda; and which I have known, when given for gonorrhœa, and the use of it has been long continued, to cause greater uneasiness than it was intended to relieve. For the full investigation of this subject, as connected with the composition and states of the urine, I must refer you to the able work of Dr. Prout, the perusal of which will afford you great information; and to the article 'Gravelle,' by Magendie, in the Dictionnaire de Medicine et Chirurgie.

When the disease of the prostate, or of the elastic structure of the bladder, or of the urethra, has given rise to chronic inflammation of the mucous membrane of the bladder, the patient has a constant sense of uneasiness in the part, a frequent desire to make water, which is more or less opaque and turbid when recently passed, with flocculi floating in it like shreds of membrane, and which the patient often mistakes for them. As the urine cools, it becomes more transparent, and deposits the mucus in a thick adhesive state, more or less opaque in colour, sometimes streaked with white, sometimes with blood, and frequently of a yellowish or purulent appearance, and in which case the urine is usually altogether alkaline. When the mucus is of a greyish colour, it is sometimes particularly viscid, especially after standing a short time in the vessel in which it has been received, and may be drawn from it in the shape of very tenacious ropy matter. This secretion is oftentimes equal to the whole quantity of urine, and sometimes becomes thickened and opaque in the bladder, and blocks up the passage, so as to be voided in portions with greater pain and difficulty. The desire to pass it and the urine is at last so much increased, that the patient is obliged to wear a particular apparatus for receiving it, or to have the urinal always at hand; by which time his health has been so much worn down, and he has become so much emaciated, and is in such constant suffering and misery, that he looks forward to his dissolution with a fervent hope for its speedy occurrence.

The urine is sometimes highly offensive, as well as when it is retained by a diseased prostate, and gives off a strong ammoniacal odour; and if ulceration has taken place, the pain is not only wearing but most acute, and the presence of the catheter cannot be borne in the bladder.

We are deficient in remedies capable of exerting a very beneficial influence on the bladder when in a state of chronic inflammation; and the discovery of new, or the better adaptation of old ones, are highly desirable points. Those we at present possess are of two kinds, general and chemical. The general means of treatment applicable to the bladder, in a chronic state of inflammation, admit of little difference of surgical opinion. The position of the patient should be as much as possible horizontal, with the hips a little raised in order to favour the return of blood from the parts affected; and, as I have already stated (page 213), the general and even the local abstraction of blood should not be had recourse to, as neither is commonly advantageous; although the abstraction of a small quantity by cupping from the perineum is often useful in alleviating any sudden aggravation of disease, and in bringing it back to its previous chronic state. The loss of a larger quantity only debilitates the patient, without influencing the state of chronic inflammation. I have, however, thought I have derived in some cases considerable advantage from the application of one or two leeches every day to the verge of the anus for twenty or thirty days successively: they act as a continual and steady drain in a manner which is not sufficiently appreciated in many diseases. A seton in the perineum has been sometimes of great service; and a steady discharge from above the pubes I have seen of use, although it has been rarely equal to the inconvenience it occasions. Blisters on the sacrum are occasionally useful in the commencement of the disease, but give rise to so much distress from their situation at a later period, that I now never resort to them.

Mercury, as an alterative, sometimes does good, and particularly in those cases in which there is no chronic derangement of the neck of the bladder; a point of importance to advert to in the treatment of the disease, and one which may reconcile some diversity of opinion on the subject; for it does not appear at first sight why a remedy which is so beneficial in many cases of chronic disease of other viscera, should be detrimental or of no use in this. I apprehend that the opinion entertained of its inutility has been formed from the observation of its effects in cases in which the prostate has also been diseased, or the chronic thickening of the neck of the bladder has taken place, or a stricture of the urethra, or other disease of this part has existed, in either of which, and it is very rare to find that one or other does not exist, it could be of little use until the complication was removed; and as it would debilitate without rendering any corresponding advantage, it must necessarily have been considered injurious. Mercury, when used, should only, I am led to infer, be given when there is no especial complication of disease, or its use should be delayed until this is removed. It is rarely also beneficial when the constitution of the individual is broken, or the disease has been of long standing, and must always be given with great circumspection. When the powers of the patient are unbroken, and the urine is acid, mercury may be tried without fear of its doing harm; but when the urine is alkaline, it always does mischief by increasing the secretion, rendering the person more nervous, and otherwise debilitating him. The countenance and appearance of a person secreting alkaline urine, implies a state in which the use of mercury is not likely to be useful. Care must, however, be taken to ascertain that the urine is alkaline when secreted from the kidneys.

Alkaline remedies, such as the carbonates of potass and soda, have been rather forbidden of late years, except in small doses combined with purgatives and with tonics, given with the view of improving the state of the *primæ viæ;* on the supposition, that, when taken in larger quantities, they would render the urine more alkaline, and consequently more irritating and more liable to calcareous deposits. The fact of their being likely to do so in such cases cannot be disputed, but they do not always do so; and I have seen them do good when they chemically ought not to have done it, and empirical seemed to have succeeded where chemical medicine failed. I suspect however, that, if closer attention had been paid to these cases, it would have been found that the urine was not alkaline when secreted, but only after it had remained some little time in the bladder. I have already said, that the alkalies do often relieve irritation at the neck of the bladder in a remarkable manner; and that when long continued, or improperly administered, they as readily increase if not occasion it.

The leaves of the uva ursi, and of the buchu or diosma crenata, and the root of the pareira brava, have all been more or less lauded in this disease, and have all equally disappointed the expectations of the surgeon. I have seen each of them of the greatest possible advantage, and I have seen each of them fail in apparently similar cases, both separately and combined, so as to leave their efficacy a matter of great doubt. It is probable that their utility may be confined to the state of chronic inflammation alone; and that, when this is complicated with derangement of the neck of the bladder, their usefulness ceases. The uva ursi is best given in pills made from the extract of the leaves, from the dose of ten to twenty grains, three or four times a-day. When given in infusion, a small quantity of carbonate of potass, such as two scruples to a pint of water, and half an ounce of the leaves, should be added during the maceration, as it enables the water to extract the virtues of the plant more effectively. The buchu should be treated in a similar manner, unless the presence of any alkaline matter in the medicine should be objectionable from the state of the urine. The root of the pareira brava is used in a decoction made by simmering half an ounce to an ounce of the root in three pints of water, containing one drachm of carbonate of potass, down to one pint; one half of which may, in a similar manner to the infusions, be taken daily. They seem gradually to diminish, and ultimately to remove, the irritability of the mucous membrane, and of course to suppress the secretion of the mucus from it which renders the urine alkaline, and forms the ropy, glairy deposit at the bottom of the utensil. The pareira brava is at present the greatest favourite, from the strong recommendation of Mr. Brodie. The buchu takes the second place.

When the bladder has been irritable, and the urine high-coloured and acid, I have given them in tincture with the liq. ammoni and with the tincture of hyoscyamus with the greatest advantage; very gradually increasing the dose of each until the effect was produced, and which is hastened in many instances by the addition of the colchicum. When the urine is, on the contrary, alkaline, and liable to deposit, the nitric and phosphoric acids should be administered instead of the ammonia.

Narcotics are, however, the most potent palliative and auxiliary remedies; and opium is the first in all its various preparations, whether given by the mouth or administered by the rectum. Hemlock and henbane, the extract of poppies and of lettuce, often afford considerable relief; and their use may be varied, or alternated with that of opium, to advantage.

The urinary stimulants have all been recommended and tried in turn; such as the balsam of copaiba, the Chian and Venice turpentines in their various ordinary and extraordinary preparations, as well as the cubebs. When given in small doses, they sometimes do good when the disease is in its early stage; but I have never seen any permanent advantage from their use at a later period.

LECTURE XVI.

The local treatment of the bar or stricture of the neck of the bladder is of the greatest importance; and, as the disease has been only of late distinguished, is not thoroughly understood. Experience has not yet enabled us to support our practice by numerous instances of successful management, although the cases which have fallen under my observation lead, I trust, to just and legitimate conclusions.

When the disease occurs in persons under or about the middle period of life, the steady use of the solid silver sound, gradually increasing the size to the largest the urethra will admit, will gradually effect a cure; although, to prevent a relapse, it should be passed occasionally. I have seen within these few days one of the first cases to which my attention was drawn, now several years ago. The gentleman is himself a medical man, and was treated by me in this manner, after believing his life to have been in danger from complete retention of urine for several hours. He assures me he is now free from inconvenience; but passes his solid bougie from time to time, lest he should suffer a relapse.

I have had, within the last twelvemonth, another medical gentleman of seventy years of age under my care, in whom this complaint was commencing, and which he believed to depend on disease of the prostate gland, the symptoms being in many respects similar. I could not however, on examination, detect any enlargement of the prostate, although some might exist, whilst the contraction of the orifice of the bladder was clearly to be felt. The frequency of making water was great, particularly at night, and the general irritation considerable; a small quantity of urine remaining unevacuated, however great the effort made for its discharge. This gentleman has been restored to health and comfort, and his symptoms all relieved, by the use of the large silver catheter, and by washing out the bladder with water as hot as he could comfortably bear it every other day. It had a marked and rapid effect upon him; and I am so satisfied of the efficacy of the remedy, and of the advantage to be derived from its use, that I strongly recommend it in all cases in which there is any affection of the bladder; sometimes combined with the various preparations of opium, and particularly those of morphia. I believe it is important that the water should be of a higher temperature than that of the urine when discharged. It should, however, be first used at 98°; and the temperature may be gradually increased until it has reached the highest point that feels comfortable and advantageous to the patient, at which it should be retained. I always inject as much as feels agreeable to him, on similar principles: at first the quantity may be small, but after a time it should be gradually increased; and whilst the bladder loses its irritability, it acquires the capability of being dilated in many instances, in which from long-continued irritation it had become thickened and contracted. The lotura vesicæ is, in fine, a means of cure which should never be neglected in diseases of the bladder, and which should only be abandoned when it is found on trial to be of no advantage.

The silver catheter or the solid sound are not however always competent to effect a cure, or even to give relief when passed from time to time. The incapability of emptying the bladder, of evacuating even an ounce of urine, remains unrelieved, although the silver catheter is introduced twice and even oftener in the twenty-four hours. The attempt to dilate the neck of the bladder by a larger or by a dilating instrument, only brings on pain and increases the evil, so that it is obliged to be given up for a smaller instrument than the one originally used, until the irritation thus caused shall have subsided. In these cases recourse must be had to the permanent catheter, or one which is retained constantly in the bladder, and which, by its slow and gradual operation, leads to the absorption of the bar or stricture in the same manner as it leads to the beating down of an enlarged portion of the prostate gland. I have reason to believe that I have succeeded in this way in many instances in affording relief, that could not be obtained by either of the other means indicated; but these cases may also have been accompanied by disease of the prostate, a point which dissection alone could verify.

This method does not however always succeed, and surgery must come to the relief of the patient by an operation. The bar or dam at the neck of the bladder must be divided, and the question is, how is it to be done with the greatest safety.

The observations I have already made on the subject of dividing the prostate gland, and with it the bar at the neck of the bladder, when such disease existed, bear upon the present question of doing it when this latter complaint exists alone. It will naturally be asked, why an operation, which Sir W. Blizard states to have succeeded so well, should have been abandoned, and its advantages be even almost unknown to modern surgeons? To this question Sir William Blizard cannot give so satisfactory an answer as could be desired; and says, that many successful operations have fallen into disuse in a similar manner. From the most careful consideration I have been able to give to the subject, I am led to believe that the operation on the prostate gland was done previously to the introduction, by Sir E. Home, of the method of treating it by the catheter, used either frequently or permanently; and that the relief obtained in this way superseded the further consideration of, or the extension of the practice by incision, inasmuch as the cases of middle-aged or otherwise healthy persons on whom it would have been done, were relieved sufficiently by this means to make life comfortable; and in persons of more advanced age, or in broken-down constitutions, it was not considered advisable to have recourse to it. That there are periods in many cases of this disease, in which the division of the prostate gland would be very advantageous, and might prolong the lives of many sufferers in comparative comfort, I am quite satisfied;

but I am no less satisfied, that the surgeon who should propose at present such an operation, unless in an extreme case, would soon be without patients to propose it to. The time will, however, arrive, when a more accurate discrimination of these diseases will be made; and operations can then be recommended with a confidence proportioned to our knowledge.

The bar formed at the neck of the bladder has, I believe, been mistaken for an enlarged prostate: it has not, at all events, been considered as a separate disease; and the use of the catheter has generally given such degree of relief as to render the patient tolerably comfortable. When however, in spite of the continued use of this instrument, the disease increases, and renders life miserable, the question is then simply, whether the person shall be allowed to die without a further effort being made for his relief? I think not; and in such a case would suggest that an operation be performed. The object is to divide the bar, dam, or stricture, with as little injury as possible to any of the neighbouring parts. When these are all sound, as far as can be ascertained, I recommend its being done by an instrument which Messrs. Everill and Mason, of St. James's Street, have made at my suggestion, being an improvement on the central perforator or lancet of Mr. Stafford, which renders it capable of cutting on the side, and of being easily cleaned. Messrs. Everill and Mason wished to call it my instrument; but as I never claim more in any instrument than the suggestion, leaving the mechanism entirely to the artist, I have begged them to take to themselves any or all the merit which may be due to it or them. The first instrument I used of the kind was made for me by Mr. Ferguson, several years ago; and he made many attempts before he succeeded. Messrs. Everill and Co. have perfected it.

When a No. 2 prostate catheter is used, and it resembles in shape the common urethra sound recommended by Mr. Stanley, it will often slip over the bar with tolerable ease; but if one with a different curve be tried, and particularly if the curve be small, or the instrument is in other words straighter, the bar will catch on the point of it, and sometimes the obstacle can hardly be overcome. When the nature of the complaint has been well ascertained by repeated examination in every way, an instrument of the same shape, carrying at its extremity the small concealed knife alluded to should be selected, and which, by a spring, is made to project as much by the side or by the end, or by both, as may be thought advisable. The knife being projected just as the instrument is felt to be passing over the bar, will cut it; and if, after it has just passed into the bladder, it be withdrawn, the little knife, in coming back, will enlarge the original cut; or it may be made altogether by the withdrawing motion of the instrument, the knife being sprung after it has just entered the bladder. If the bar be thin or narrow, I have no doubt of the possibility of dividing it in this way without doing mischief; and in two cases in which I have tried it, I have reason to believe the object was effected, from the greater facility with which the catheter afterwards passed into the bladder, and from the relief obtained in passing the urine. I do not however believe, that when the bar is complicated with an enlargement of the middle or of the left lobe passing behind it, the division of it can be effected in this manner; and I am at present disposed to confine this mode of operating to the pure cases I have described in the lithograph facing page 33, and in those only when relief can be obtained by no other means. If the bladder is full, or contains a fair quantity of urine for its size, no injury can easily accrue to any other part in the operation; and there are no large vessels to divide. The merits of the proceeding can only, however, be fairly and fully ascertained by the examination after death, of some cases in which it has been tried without success, or without being able to save the life of the individual. The advantages and disadvantages will then be soon seen, and the necessary improvements will be made, so as to meet the exigencies of each particular case; for I cannot divest myself of the impression that they are curable, even as late as when the mucous membrane of the bladder is about to pass into a state of chronic inflammation; and I am sure, that, when it is in that state, any operation that can be proposed must be advantageous to the patient. In all these cases, even in the worst (and this is peculiar to them), the catheter meets with little difficulty in passing into the bladder; and this operation should not be attempted when it does not, for the probability is, that in such case it is not the very neck of the bladder which is in fault, but that the patient has either a false passage, or a disease of the prostate gland. I have at this moment under my care two gentlemen in this situation. One has a

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false passage commencing about five inches down and proceeding behind the prostate and bladder, both of which can be raised by depressing the handle of the instrument, the end of which might of course be readily forced through, if it were a little pointed. He also knows when it takes this course, by a peculiarly disagreeable sensation which he describes as appertaining to the rectum. The sensation is not less peculiar, although very different, when it takes the right course, which it always will do by a little management in bearing the point against the upper surface of the urethra in a particular manner which practice has taught. The same instrument will go either way; a No. 11 enters the bladder and draws the urine off at seven inches, whilst it will go ten in the false passage. In the other gentleman, the instrument passes eleven inches, and can be felt in the same situation when the handle is depressed, raising up the bladder. An error, giving rise to an operation, in either of these cases, would, I apprehend, be a very great misfortune, and might be followed by fatal consequences from the extravasation of the urine; for although it does not pass backwards into the false passage in any quantity, it might be very different in its effects if it passed direct from the bladder into it, particularly when newly made.

We have at present in the Westminster Hospital, a man who has a bar at the neck of the bladder, a certain degree of enlargement of the prostate, and a stone in the bladder. The passage of the No. 2 prostate catheter is obstructed in the prostatic part of the urethra, and cannot readily proceed; a large common catheter passes through this part easily, is arrested by the bar, but after a little hesitation rides over it into the bladder. The attempt to cure this man of his stone, by breaking it up by lithotrity, would be absurd. The only operation which ought to be done is the lateral one, and by which the three diseases might be cured at the same time.

In the very advanced stages of the disease, when the bar is fully formed, when pouches exist, and the mucous membrane is in a state of chronic inflammation, giving rise to an almost continued and irresistible desire to make water, whilst the agony in passing a few drops is extreme ; I believe it will be found, that an operation similar in its effects but milder in its nature than that for the stone, is the one which ought to be had recourse to, if relief is to be obtained from operative surgery. In such cases, I suspect that the capability for action in the neck of the bladder must be suspended, as well as the dam formed at its orifice divided. The urine will flow involuntarily for several days, time will be given for the chronic irritation to subside ; and when the cut parts have reunited and the bladder begins to resume its functions, no bar will be found to derange its natural actions and to re-excite that irritation which cannot fail to be ultimately fatal.

The lateral operation for lithotomy will I think answer, with this exception, that it will on the whole be milder. The division of the neck of the bladder and of the prostate must be as lateral and depending as the safety of the rectum will permit, and should never extend quite to the boundary, or external wall, or covering of the prostate gland. It need not be of a larger size than will admit the finger easily to examine the neck of the bladder, and to ascertain that the division of it and of the bar have been properly accomplished.

It is possible that the bar at the neck of the bladder may be more safely divided, and perhaps on easier terms, by opening the urethra in the central line of the perineum, after the manner I have recommended, page 166, for the division of a stricture. The operation will however be much more simple, inasmuch as the urethra can be opened on a grooved staff passed into the bladder, when a straight director may be introduced in its place, in which a probe-pointed strong but narrow knife can be passed. The director may then be withdrawn, when by raising the handle of the knife and in this manner depressing the probe point in the bladder, it may be made to cut its way through the bar and to the left side of the urethra, without dividing the prostate so as to injure the rectum. I have not had the opportunity of doing this operation, and cannot therefore recommend it as sanctioned by experience. I must be contented to suggest its practicability.

After any of these operations have been done, and one great source of irritation has been removed, the greatest possible attention must be paid to the state and qualities of the urine, so as to bring it to and to keep it as nearly as possible in its natural state, or no permanent advantage will be obtained.

INDEX.

The Bladder:—
  Structure and functions of, 1, 2.
  Shape and minute anatomy of, 3, 4.
  Entrance of ureters into, 5.
  Manner in which the urine enters, 6, 7.
  Sensibility of the triangular space of, 9.
  Nerves which supply this portion, 9.
  Objections to the operations for puncturing the bladder through the rectum and above the pubes, 10, 11.
  On the cavities of, 12.
  On the inferior ligaments of, 13.
  On the anatomy of the external coat of, 14, 15.
  On the elasticity of the neck of, 15, 16.
  Definition of the neck of, 17.
  On the diseases of the elastic structure of the neck of, 26, 27.
  On pouches of, 28—30.
  On the fluttering blows of, 31.
  On rupture of, 110.
  Morbid secretions of the mucous membrane of the bladder in acute and chronic inflammation, 113.
  Hemorrhage from the neck and other parts of, 137—145.
  Mode of puncturing the bladder through the rectum, 163, 164.
  Operation of puncturing the bladder above the pubes, 250, 251.
  Chronic thickening of the neck of, 254, 259.
  On acute inflammation of, 260.
  Treatment, 261.
  On chronic inflammation of, 262, 263.
  Treatment, 266, 270.
  On the bar at the neck of the bladder, 271, 272.
  Treatment, 273, 280.

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From operations, 150.
From retention of urine, 151, 152.

STRICTURE:—
On the usual seat of, 74.
On the cause of, 74, 76.
Stricture of the anterior portion of the urethra, 78, 79.
The nature of permanent stricture, 80, 81.
Mr. Hunter's views of spasmodic and permanent stricture, 86.
Sir E. Home's views of the same, 87.
Sir C. Bell's views of the same, 87.
On spasmodic contraction of the urethra, 88, 89.
Treatment, 89, 91.
Distinction between spasmodic and permanent stricture, 91, 92.
The formation of permanent stricture, 92, 103.
On the symptoms of, 104, 106.
Hernia caused by, 107.
Hemorrhoids caused by, 107.
Abscess caused by, 108.
Hernia humoralis caused by, 109.
Fistula in perinæo caused by, 112.
Cure of stricture by dilatation, 122, 130.
Cure of stricture by caustic, 131—135; 145—148.
Treatment of impassable stricture, 178; 188—210.

THE URETERS:—
Passage of calculi through, 5.
Muscles of, 6.
Their action, 9.
Calculus remaining in the ureter giving rise to symptoms of calculus in the bladder, 6.

THE URETHRA:—
Muscles of,
  Compressor urethræ, 39—48.
  Acceleratores urinæ, 50—51.
Excretory ducts opening into, 20.
The membranous portion of, 38.
Camper's ligament, and the manner in which the urethra passes through it, 49, 50.

On the length of, 52, 53.
On the lacunæ of, 55.
On the size of the male urethra at its different portions, 56, 57.
Peculiarity of structure at the orifice of, 57.
Variations of size and situation of the orifice of, 58, 59.
Structure of, 72, 74.
On the corpus spongiosum urethræ, 77.
On the loss of elasticity of the, 82, 83.
The mucous secretion of, 83.
Situations where false passages most commonly occur, 84.
Rupture of, 110, 111.
Method of examining, 114, 122.
Hemorrhage from, 135, 137.
Manner of applying pressure in hemorrhage from, 137.
The operation of opening the urethra from the perineum, 164, 171.
On the use of catheters after the urethra has been opened, 176.
Method of fixing a catheter in the urethra, 177.
Abscess in the perineum from ulceration of, 186.
Treatment, 186, 187.
Irritation of the prostatic portion of, 224.
Treatment, 225.

ON THE USE OF SOUNDS AND CATHETERS:—
Manner of introducing a solid sound, 59, 61.
Manner of using a straight instrument, 63.
The shape and mode of introduction of the catheter in enlargement of the prostate gland in elderly men, 64; 248, 249.
The form and curvature of solid sounds, 65, 66.
Objections to flexible bougies, 66.
Flexible metal catheters to be kept in the bladder in enlargement of the prostate gland, 67, 68.
Manner of using metallic, flexible, and wax bougies, 68, 69.
On gum elastic catheters, 70, 71.

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